DOCUMENT RESUME

ED 113 609 95 CE 005 415

AUTHOR Diamond, Esther E., Ed.
TITLE Issues of Sex Bias and Sex Fairness in Career Interest Measurement.
INSTITUTION Aries Corp., McLean, Va.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C. Career Education Program.
PUB DATE 75
CONTRACT OEC-0-72-5240
NOTE 239p.

EDRS PRICE MF-$0.76 HC-$12.05 Plus Postage
DESCRIPTORS Affective Tests; Career Choice; Discriminatory Attitudes (Social); Equal Opportunities (Jobs); *Evaluation; *Females; Feminism; Interest Scales; *Interest Tests; Minority Groups; Racial Discrimination; *Sex Discrimination; Sex Role; Sex Stereotypes; Test Bias; *Vocational Interests; Working Women
IDENTIFIERS *Career Interest Inventories; National Institute of Education; Readings (Collections)

ABSTRACT

A series of papers and guidelines, resulting from the National Institute of Education (NIE) Career Education Program's study of sex bias and sex fairness in career interest inventories, are presented in the document. Intended for publishers and users of career interest inventories and related services and materials as standards for evaluating sex fairness, the guidelines are presented in the following sections: the inventory itself, technical information, and interpretive information. Eleven papers are presented, dealing with issues identified by the NIE Career Education Program Planning Group study. Chapter topics include: (1) the impact of interest inventories on female career choice: (2) the use and evaluation of interest inventories and simulations; (3-4) technical aspects of interest measurements; (5) the face validity of interest measures; (6) factors affecting a client's view of interest inventories; (7) sex bias in terms of black women; (8) interest inventories and the mature woman; (9) the cost of developing interest inventories; (10) counter-based guidance systems analyses; and (11) legal implications of sex bias in interest inventories. Each paper contains an abstract and is discussed in the overview. Background material is supplied in the forward, and the book is indexed. (LH)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED113609

Issues of Sex Bias and Sex Fairness in Career Interest Measurement

ESTHER E. DIAMOND, EDITOR

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

CE 005 415

Department of Health, Education, and Welfare
National Institute of Education
Career Education Program
Spring 1975

F 2/3

Table of Contents

NIE Career Education Program staff and Planning Group members v

Foreword • LOIS-ELLIN DATTA vii

Overview • ESTHER E. DIAMOND xiii

Guidelines xxiii

1/ **Impact of Interest Inventories on Career Choice**
• NANCY S. COLE and GARY R. HANSON 1

2/ **The Use and Evaluation of Interest Inventories and Simulations** • JOHN L. HOLLAND 19

3/ **Technical Aspects: Problems of Scale Development, Norms, Item Differences by Sex, and the Rate of Change in Occupational Group Characteristics—I**
• LENORE W. HARMON 45

4/ **Technical Aspects: Problems of Scale Development, Norms, Item Differences by Sex, and the Rate of Change in Occupational Group Characteristics—II**
• CHARLES B. JOHANSSON 65

5/ **Face Validity of Interest Measures: Sex-Role Stereotyping**
• MARY FAITH TANNEY 89

4

6/ Reducing Sex Bias: Factors Affecting the Client's View of the Use of Career Interest Inventories
• JANICE M. BIRK 101

7/ A Consideration of Race in Efforts To End Sex Bias
• JANICE PORTER GUMP and L. WENDELL RIVERS 123

8/ Expanding Opportunities for the Reentry Woman: The Use of Interest Inventories With the Mature Woman
• MARY ELLEN VERHEYDEN-HILLIARD 141

9/ Costs of Developing Interest Inventories and Implications for Change • JO-IDA C. HANSEN 161

10/ Sex Bias and Computer-Based Guidance Systems
• JO ANN HARRIS BOWLSBEY 177

11/ The Legal Implications of Sex Bias in Interest Inventories
• LAURINE E. FITZGERALD assisted by B. JEANNE FISHER 201

List of Abbreviations 213

Index 215

NIE Career Education Program Staff and Planning Group Members

National Institute of Education
Career Education Program Staff
Washington, D.C.

Lois-ellin Datta
Lance Hodes
Nancy J. Hunt
Marylou Randour
Corinne Rieder

Senior Consultant, NIE Career Education Program, and Chairperson, Planning Group:
Esther E. Diamond
Guidance Programs Laboratory
Science Research Associates
Chicago, Illinois

Planning Group

Jo Ann Harris Bowlsbey
Education Department
Western Maryland College
Westminster, Maryland

Herlinda Cancino
Harvard University
School of Education
Cambridge, Massachusetts

Nancy S. Cole
Research and Development Division
The American College Testing Program
Iowa City, Iowa

Janice Porter Gump
Counseling Center
Howard University
Washington, D.C.

Robert L. Linn
University of Illinois
College of Education
Urbana, Illinois

L. Wendell Rivers
Mental Health Specialist Program
University of Missouri
St. Louis, Missouri

Carol Tittle
Department of Education, Queens College
The City University of New York
New York, New York

Mary Ellen Verheyden-Hilliard
Sex Equality in Guidance Opportunities Project
American Personnel and Guidance Association
Washington, D.C.

Louise Vetter
Center for Vocational and Technical Education
Ohio State University
Columbus, Ohio

Foreword

Outside my window a building is being demolished. The crane operator and the laborers are all men. Almost all of the people I see on the streets in this professional and business section of town are men. Inside my office there are women, of course: all the secretaries are women. There are men, too: most of the professionals and all of the top managers are men.

Why is this so? Has the counseling and guidance movement, and tools of its trade such as vocational interest inventories, contributed to occupational sex stereotyping, or reduced it?

Vocational interest measurement has existed for over 50 years, almost half the span of psychology as a discipline. The first instrument, the *Carnegie Interest Inventory,* was published in 1921. Buros' first *Mental Measurements Yearbook,* which appeared in 1939, included 15 measures of vocational interest.

Although exact figures are hard to come by, vocational interest inventories seem to be widely used. Almost every youth probably takes at least one vocational interest measure before leaving high school, a practice that is likely to increase.

Do inventories matter? Surprisingly little is known about the immediate or longer-term effects of taking an interest inventory, and even less about what measurable effect taking one alone or in concert with vocational guidance should have. There are a few reports on whether counselees think inventories are helpful or how seriously the findings are regarded. Almost everyone I've asked, however, has taken an interest inventory and can recall—often after many years—both what

7

the inventory was like and what it found regarding their vocational interests.

The endorsement of counseling and guidance centers in purchasing existing inventories and supporting the development of improved measures indicates that the intermediate consumers—the school advisers and counseling specialists—find them valuable. In the absence of evidence to the contrary, it is assumed that inventories can and do improve vocational choice.

One reason for examining the effects of vocational interest inventories is the rising concern with improving career choices for young people and adults. The career-education movement has stressed the importance of increasing individual awareness of the world of work, expanding career horizons, and helping people make choices that will reduce what Ivar Berg has called the "horrible misfits" between the individual and the job and reduce, too, the human wastage of potential talent less dramatically but still substantially misapplied.

The development of computer-based career-guidance systems, expansion of career-information services for women, the surge in adult education, and the spread of career education throughout public schools all indicate that vocational interest inventories are likely to be more widely applied in the coming decade than ever before. At the same time, women increasingly are demanding occupational and social equity and their rights to the full range of life choices available to men.

Examination of the usefulness of career interest inventories with special reference to the question of sex fairness and sex bias thus seems particularly timely.

If status and earnings are a measure of change, then—contrary to the popular advertising slogan—women have come a short way, baby, in the past 50 years. According to the Department of Labor, women are entering the labor market in increasing numbers; yet the distribution of women in traditionally masculine (and usually higher paying, higher status) occupations is virtually unchanged. Unchanged also is the degree of sex stereotyping, indicated by a low proportion of men in occupations traditionally filled by women.

One explanation of these inequities—that women have discontinuous and shorter work experiences and may be lacking in career commitment—has been challenged by recent analyses showing that many women regard their work as highly as do men and have as much continuity of employment. Even when

educational credentials and employment histories have been equalized, however, men make more money than women and have higher status in the same occupations.

New legislation and its enforcement may help reduce such blatant discrimination as gender criteria for employee selection and unequal pay for equal work. Although the pull of equal employment opportunity may attract many men and women to nontraditional occupations, it seems likely that legislation alone will not be sufficient to correct the unequal flow of women into higher status, better paying occupations. Limitations on occupational aspiration seem to begin much earlier: almost all little girls want to be teachers or nurses (or, at about age 12, secretaries); little boys have far more varied occupational aspirations, and many more expect to enter higher status occupations.

The extent to which career interest inventories are sexist is unclear. What constitutes sex fairness or sex bias in career counseling and career inventories is itself uncertain. Development of greater certainty about definitions and issues seems an essential step toward insuring sex-fair counseling for the hundreds of thousands of men and women who will experience some form of guidance during the next decade.

The purpose of the NIE-sponsored study that has produced this book of readings is to examine the technical and social issues, to create a greater understanding of the problem, and to suggest some acceptable answers.

In developing the study, we tried to avoid the shrill tone that appears to assume that whatever is, is out to get us. The following steps were taken:

1. *Planning group and senior consultant.* After a review of the literature by National Institute of Education staff, which indicated the need for the study, a senior consultant (Esther E. Diamond) and a group of researchers skilled in counseling and guidance, psychology, and test development were selected. The group included women and men from different ethnic backgrounds.

2. *Identification of issues.* The Planning Group identified significant issues in the relationship between sex fairness and career interest inventories. Some issues were suggested by Career Education Program staff; some were developed by the

Planning Group. Researchers were chosen to prepare papers on the selected issues. Again, attention was given to including men and women who represented different cultural perspectives. Researchers identified with one position or another on some issues and those personally involved in interest inventory development were sought out as writers.

3. *Discussion and workshop.* Recognizing the importance of ample discussion from various perspectives, the Planning Group urged both careful development and extensive discussion of the papers. The list of candidates for the workshop was long, and selecting a group small enough to permit discussion was difficult. The final list of invitees achieved the balance sought and seemed likely to insure lively, informed, full discussion of controversial issues.

4. *Unanimity or diversity?* From some points of view, a unanimous set of guidelines would be the most valuable product. It seemed likely, however, that the study would be most successful if it exposed diverse opinions. To insure that these opinions are represented, both thesis and dissent are included in the workshop report and the book of readings.

In this study the NIE has continued the examination of the question of sex fairness and sex bias in career interest inventories initiated in professional organizations and journals. We hope that bringing together a diversity of viewpoints on the salient issues will increase sensitivity to the question and help the reader decide whether the issues are as important as we believe them to be or whether they are pseudo questions. The papers present a variety of ideas for practical use by those concerned with vocational interest testing, but reach no unanimity on what may be the most central question: Should inventories follow the socialization practices apparently shaping career choices at even very early ages, or should inventories and their interpreters intervene to change these practices and their consequences?

Under the leadership of Dr. Diamond, the Planning Group and NIE staff have brought together a thorough examination of one aspect of the educational process—sex fairness and sex bias in career interest inventories—that should contribute to improving career choices for many youth and adults, an im-

provement contributing, in turn, to a sex-fair world outside our windows and inside our workplaces.

LOIS-ELLIN DATTA
National Institute of Education

Overview

The assumption that the characteristics necessary for satisfaction and success in a particular field or occupation are associated with being male or being female is, at long last, losing its grip—but too, too slowly. Labor Department reports tell us that although women work in all occupations, they are predominantly in clerical and other low-level jobs, and that even in professional and technical occupations about two-thirds of the women are employed as nurses or teachers, mainly in the primary grades. Men, too, have been discouraged from looking at the total occupational spectrum—including secretarial work, primary school teaching, nursing, dietetics, and other fields that have been stereotyped as women's work. For both sexes, the problem is even more aggravated in the case of various minority groups and low socioeconomic groups.

That the situation described exists is a matter of little or no controversy. What is controversial is the question of what to do about it, particularly with reference to the use of interest inventories in career guidance. It is this question that is explored in the series of papers presented in this book. As the papers point out, many factors contribute to sex stereotyping and its perpetuation: early socialization; parental attitudes and pressures; teachers' attitudes; the school curriculum and materials; the media; and overall societal attitudes and pressures. In career-guidance programs, the selection of career-guidance materials and the program context within which they are presented will be influenced by what is available; the counselor's or teacher's own life experiences, needs, and values;

community pressures and goals; and such school characteristics as socioeconomic and ethnic mix and the general achievement level of the students.

All these aspects of sex bias in career development are reflected in the problems encountered in trying to make interest inventories as free of sex bias as possible. Many technical problems of scale development and criterion and norm group composition are involved—separate versus combined sex norms or criterion group composition; the lag between gathering of data and societal change; the differences in male and female response rates to inventory items; the inventory administration context; and the predictive-validity dilemma posed by the fact that data based on past behavior are the best predictor of future behavior.

How, then, can we change the status quo? Where do we start? Must we have children with *tabula rasa* minds and adults from whom all vestiges of bias have been expunged before we can hope for change? We have to live with the fact that people and societies change slowly, even in the face of widespread affirmative action and corrective legislation. But many counselors, psychologists, and sociologists see themselves as catalysts of change, choosing not to sit back and wait for change to happen, but to *make it happen.*

Each of the papers presented here deals with a major facet of the issues identified by the NIE Career Education Program Planning Group study and discussed at the workshop in March 1974. Not all of the papers are in complete agreement, but each represents an honest, constructive approach to that aspect of the problem the author was asked to deal with.

In the first paper Cole and Hanson, examining the impact of interest inventories on career choices—particularly the career choices of women—define interests as a constellation of likes and dislikes leading to consistent patterns of behavior, which we measure in order to predict some types of job satisfaction. Just how interests are linked to job satisfaction, however, the authors point out, is something about which theories of interest tell us very little.

Two dominant rationales for interest measurement are described by Cole and Hanson: the people-similarity rationale, linking satisfaction to the degree of similarity between an individual's likes and dislikes and those of people in a given occupation; and the activity-similarity rationale, linking satis-

faction to the degree of preference for activities similar to those required in an occupation. But the people-similarity rationale, they point out, relies heavily on a stable socialization process tied very closely to the past; when the future follows a new direction, departing from the status quo, the empiricism of interest measurement becomes a weakness instead of a strength, impeding the path of constructive change. Questions about the activity-similarity rationale are raised by the differences in socialization of boys and girls. Somewhat at variance with the views expressed by Holland in the paper following, the authors question whether the socialization process for girls is as predictive of job satisfaction as the same process is for boys. While they see a dilemma in the opening up of a wide range of career options for girls before the socialization process has been broadened sufficiently to enable them to take full advantage of such a range, they feel that expanded career opportunities will predominate over past socialization and that women will find satisfaction in a wide range of careers.

An interim course of action to be followed while answers to long-range questions are sought through carefully designed research studies is recommended: interest inventories should be used in the context of broad career exploration, to stimulate the student to broaden the exploration process through new job or job-related experiences, and to suggest to students occupations that would extend the options of both sexes throughout the full range of occupational areas. In a period of change when predictive validity based on the past may actually be counterproductive, the suggested interim use of interest inventories is viewed as less potentially destructive than letting past socialization dominate a woman's career exploration and decisionmaking, confining her consideration of careers to the limited range acceptable in the past. In the meantime, the authors caution, research directed toward a better understanding of the relation between interests and types of job satisfaction must continue.

Holland's basic argument is that no one escapes his or her life history and that interest inventories would do a disservice if they encouraged people to enter occupations grossly inconsistent with their socialization experience. People's life histories, he maintains, lead to fitness for some groups of occupations as opposed to others. In a comprehensive description of the characteristics of an ideal inventory, however, he suggests

that such an inventory should provide information that is "in accord with a person's life history, current circumstances, and personal potential *rather than* factors such as age, race, sex, and social status [emphasis supplied]." The implication here seems to be that age, race, sex, and social status—principal factors in most problems involving bias—are *not* part of a person's life history and current circumstances.

Holland takes issue with the NIE working definition of sex bias, arguing that if literally applied it would "prohibit parents from speaking to their children, husbands to wives, wives to husbands, or lovers to lovers"—an argument that some might describe as *reductio ad absurdum.* Charges of sex bias in interest inventories, he maintains, rest on "imagined effects and words assumed to be offensive to women." He makes a plea for evaluation of interest inventories on the basis of their effects rather than any other criterion.

In regard to interventions to reduce occupational stereotyping, Holland expresses the opinion that they come too late to be truly effective. He suggests as a more practical approach *pre*vention, through appropriate preschool experiences, parents, and others—a suggestion which another paper presented here (Birk) regards as important, but as representing an "either-or" rather than an "and also" approach.

It is perhaps in Holland's recommendations for research and his summary statement of goals that one finds a high degree of consensus with the views of those with whom he otherwise expresses strong and frequent disagreement. In the stated aims of his recommendations can be found what may, after all, be the crux of the matter—the need to investigate the origin and correlates of interest, particularly as they pertain to vocational development; to learn more about the actual effects of interest inventories; and to suggest social actions that will broaden *everyone's* prevocational experiences.

Harmon, dealing with the technical aspects of interest measurement—including scale development, norms, and differences in item responses by sex—points out that there are few if any jobs in today's world of work that require skills and abilities possessed exclusively by one sex or the other, and that there are in fact few such skills and abilities. She traces the ways in which sex bias has entered every area of interest inventory construction—selection of items, development of scales, and norming—based on the assumption, in the earliest days of in-

terest inventories, that the world of work is split into man's work and woman's work.

Harmon presents interesting data on the sex differences in item responses for men and women in the same occupation—differences that vary from 30 to 58 percent. Problems related to same and different norms for the two sexes are explored, as are differences in time patterns or schedules of career development for men and women. In the second of what Harmon has labeled "two psychometric fantasies," she explores the procedure she would follow, given an unlimited grant to build a new interest inventory that would minimize or eliminate sex bias. Here are the recommendations for all needed research, for the most ideal of interpretive materials, for the best of all possible psychometric situations. Coming back to reality, Harmon places first priority on investigation of whether the view of the world of work as dichotomized by sex is really necessary in interest measurement, and she suggests a list of guidelines for determining the answer.

Recognizing the value of Cole and Hanson's recommendation that internally referenced (homogeneous) scales be used to locate an individual's interests in the circular structure postulated and to generalize from that position to the full range of occupations that occupy nearby positions in the structure, Harmon expresses reservations because occupational locations in the structure are not based on vocational preferences of employed adults and therefore do not possess demonstrated predictive validity.

Johansson, dealing with the same technical problems that Harmon discusses, but from a somewhat different point of view, presents a paradigm of valid and nonvalid, or stereotypic, male-female differentiating items for the Strong Vocational Interest Blank (SVIB), with the nonvalid differences representing differences between in-general samples rather than criterion group samples. The research described casts light on a major problem, that of the appropriate composition of in-general samples for the two sexes and the implications for interpretation of scores on cross-sex scales. Unfortunately, the problem is not pursued in great depth.

Johansson places great emphasis on the stability of response preferences over time, but he concedes that "when new scales are developed for an old inventory, a modernization factor occurs in the content of the new scales. . . . If newly

developed scales are added to existing scales on an inventory developed 15 to 20 years earlier, this modernization factor is likely to occur." No explanation is given, however, of how this would affect existing occupational scales or what the implications are for male-female differences on same- and cross-sex scales. It is interesting to note, too, that the stability studies cited also cover a relatively stable period with regard to acceptance of sex-role stereotypes. A question might well be raised as to whether studies including the early 1970's and the 10 years following would yield quite different results.

For homogeneous or internally based scales, Johansson recommends using a combined (male and female) general reference group as the normative sample for converting raw scores to standard scores, but providing separate norm distributions by sex for interpretive purposes.

Birk deals with sex bias in the context of factors that affect the client's view of the use of interest inventories. Related research is thoroughly documented. Manuals and interpretive materials for various interest inventories are evaluated in terms of explicit suggestions and subtle implications that could have deleterious effects on female clients, and recommended changes are directed at maximizing counselor effectiveness on the client's behalf. Findings of studies in which instructions for administration were modified are reviewed; particularly interesting are those that deal with reduction of home-versus-career conflict and those in which women try to perceive men as approving nontraditional career goals.

Most research relevant to counselor bias, Birk finds, indicates that counselors of both sexes view traditionally feminine occupations as more appropriate for women clients than traditionally "masculine" career goals. Included in her recommendations are an examination of the development of interests in the area of women's vocational goals, and workshops where counselors can develop an awareness of sex roles and the strategies needed to counter stereotyping.

Tanney focuses on the face validity of interest measures—what the interest inventory appears superficially to measure rather than what it measures empirically, and whether on the face of it the content is acceptable to the test taker from the point of view of language used, situations described, and activities presented. She examines three of the most widely used interest inventories and looks at interest measurement gener-

ally in the light of standards established by the National Vocational Guidance Association and the American Psychological Association. No empirical data could be found to evaluate the hypothesis that the linguistic structure of inventory items does or does not influence results.

Gump and Rivers deal with issues of sex bias relevant mainly for black women: status, occupational choice, motivation, sex-role attitudes, and technical issues. In four of seven studies examined by the authors, black women were found to have higher educational or occupational aspirations, or both, than white women when socioeconomic status was controlled; the proportion of black women who wish to combine full-time employment with marriage, home, and children was roughly twice that of white women. The studies also indicated that black women constituted 60.8 percent of the black professional class in 1960, whereas white women constituted only 37.2 percent of the white professional group. (More recent data, covering a period of many dramatic changes, are not given, most likely because they were not available. The authors also point out that the findings from various studies differed, possibly because of the nonparallelism of samples with regard to region, age, and other variables.) This greater representation of black women in professional occupations compared with black men has occasioned considerable debate about the black woman's greater "progress" in relation to that of her man, according to the authors, who point out that the problem is not that black women are overrepresented in the professions but that black men are woefully underrepresented.

Within the professional class, however, Gump and Rivers point out, black women are concentrated in fewer professions than are black men, white women, or white men, and the occupations in which they are employed are traditionally more feminine than are those of any other group. The black woman's occupational expectations and actual participation, the authors conclude, stem more from the fact that she has had to take on aspects of the traditional masculine role than from the embracing of an achievement ethic; actually, she appears to endorse the traditional view of the feminine role more strongly than does the white woman, believing that a woman's identity derives primarily from marriage and that a woman should be submissive to a man.

In reference to interest inventories, the authors express the opinion that there may be a mismatch between the interest structures of the normative or criterion groups of females used in interest inventories and the interest structures of black women. Use of a moderator variable in measuring interests of minority groups is suggested. The authors' references regarding unfairness of tests in general when used with minority groups tend to involve mainly tests of skill, aptitude, and knowledge—tests used for selection in education and employment rather than principally for self-assessment, guidance, and occupational exploration, which are the principal purposes of interest inventories.

Recommendations for practice and future research are made with reference to the special problems of interaction between race and sex. Occupational attainment and its antecedents, rather than occupational striving, the authors suggest, should be a target of research, in addition to the internal-external control variable in relation to occupational aspiration and attainment. In a concluding summary they deplore the fact that failure to attain on the part of blacks and other minorities is perceived as the fault of the victims rather than of the institutions—trade unions, industries, and schools—that victimize them.

Verheyden-Hilliard examines the use of interest inventories with the mature woman reentering the world of work after a long absence, or entering it for the first time, or seeking more meaningful work than that which she is presently engaged in. The author's main concern is with the effects of the socialization process, which limits career expectations and aspirations for girls and women, and how these effects can be offset. She discusses the need for counselor awareness of and sensitivity to home-career conflict problems, time and age factors, sex-role research, and the full range of options the mature woman might consider.

Verheyden-Hilliard also points out that simple sex fairness followed by "benign neglect of the crucial effect of socialization" will not do the job. Affirmative action in instructional and interpretive materials, plus followup information and appropriate in-service training for guidance personnel, is urged.

Hansen, drawing on her experience at the University of Minnesota Center for Interest Measurement Research, deals

with the cold, hard problem of how much it costs to develop an interest inventory in the first place, and to revise it subsequently for purposes of updating, adding new scales, renorming, and making other necessary changes. She realistically points out that ultimately—after all the issues discussed in the other papers presented here have been settled and all necessary guidelines formulated—elimination of sex bias in career interest inventories will depend on project funding. The actual costs—$385,000 for complete revision and publication of an interest inventory such as the SVIB, plus another 40 to 100 percent of development costs ($270,000) for overhead expenses—provide a very rough idea of the amount of unlimited project funds needed to fulfill Harmon's self-styled psychometric fantasy.

Bowlsbey analyzes five major currently operational computer-based guidance systems in terms of the potential for sex fairness or sex bias in the six components of such systems: the interactive dialog, the data files, the computer program itself, the interest inventories employed, the audiovisual aids, and the supporting documentation for the system. Unique features of such a system include the capability to store and retrieve masses of data, to facilitate instant updating of information, to interrelate data in such a way as to make them relevant to users at the time of decisionmaking, and to permit the student to hold a conversation, or to interact, with the computer. However, Bowlsbey cautions, the information the system gives the user will be only as accurate and as up to date as that which is available to the system developer for input.

Fitzgerald's paper, the last presented, draws largely from court decisions on ability tests used to make employment decisions. She points out that at present there are no recorded judicial decisions that directly challenge or affirm the use of interest inventories in educational instututions or employment but that inferences can be made from legal precedents regarding the use of intelligence tests in public education and employment.

Progress in reducing sex bias in interest inventories can already be seen: Recent changes in the Strong Vocational Interest Blank (now the Strong-Campbell Interest Inventory) and the Kuder Occupational Interest Survey bring them into greater conformity with the NIE guidelines. Work is under way on a learning kit for counselors, to aid them in delivering

sex-fair counseling services—including sex-fair use of interest inventories. A Government-funded Sex Equality in Guidance Opportunities Project has been established by the American Personnel and Guidance Association.

A next major step forward would be implementation of the research recommendations included in the papers presented here, beginning with the most urgent of the recommendations. Change may be slow, for much more is involved than just changing the inventories. But changes will come, and we can look forward to a day when no career will be considered atypical for one sex or the other, and when everyone—regardless of sex or ethnic membership—will have a truly free choice regarding his or her career development.

ESTHER E. DIAMOND
Science Research Associates
Chicago

Guidelines for Assessment of Sex Bias and Sex Fairness in Career Interest Inventories

(FIRST EDITION, JULY 1974)

The following guidelines have been developed as part of the National Institute of Education (NIE) Career Education Program's study of sex bias and sex fairness in career interest inventories. They were developed by the NIE career education staff and a senior consultant and nine-member planning group of experts in the fields of measurement and guidance, appointed by NIE. The draft guidelines were discussed in a broadly representative three-day workshop sponsored by NIE in Washington, D.C., in March 1974. Through successive revised drafts, culminating in this edition of guidelines, the diverse concerns of inventory users, respondents, authors, and publishers were taken into consideration and resolved as far as possible.

During the development of the guidelines the following working definition of sex bias was used:

> Within the context of career guidance, sex bias is defined as any factor that might influence a person to limit—or might cause others to limit—his or her consideration of a career solely on the basis of gender.[1]

The working definition expresses the primary concern that career alternatives not be limited by bias or stereotyped sex roles in the world of work.[2] The guidelines represent a more specific definition than previously available of the many aspects of sex fairness in interest inventories and related interpretive, technical, and promotional materials. The issues identified in the course of guideline development are dealt with in commissioned papers to be published by the U.S. Government Printing Office as a book, *Issues of Sex Bias and Sex Fairness in Career Interest Measurement* [this publication], available

from the Career Education Program, National Institute of Education, Washington, D.C. 20208, early in 1975.

The term *career interest inventory*, as used in these guidelines, refers to various formal procedures for assessing educational and vocational interests. The term includes but is not limited to nationally published inventories. The interest assessment procedures may have been developed for a variety of purposes and for use in a variety of settings. The settings include educational and employment-related settings, among others, and the uses include career counseling, career exploration, and employee selection (although the latter may also involve other issues of sex bias in addition to those discussed here).

The guidelines do not represent legal requirements. They are intended as standards (*a*) to which we believe developers and publishers should adhere in their inventories and in the technical and interpretive materials that the American Psychological Association (APA) *Standards for Educational and Psychological Tests* (1974) requires them to produce and (*b*) by which users should evaluate the sex fairness of available inventories. There are many essential guidelines for interest inventories in addition to those relating to sex fairness. The guidelines presented here do not replace concerns for fairness with regard to various ethnic or socioeconomic subgroups. The guidelines are not a substitute for statutes or Federal regulations such as the Equal Employment Opportunity Commission (EEOC) selection guidelines (1970) and Title IX of the Education Amendments of 1972, or for other technical requirements for tests and inventories such as those found in the APA standards. The guidelines thus represent standards with respect to sex fairness, which supplement these other standards.

The guidelines address interest inventories and related services and materials. However, sex bias can enter the career exploration or decision process in many ways other than through interest inventory materials. Several of the guidelines have clear implications for other materials and processes related to career counseling, career exploration, and career decisionmaking. The spirit of the guidelines should be applied to all parts of these processes.

The guidelines are presented here in three sections: I, The Inventory Itself; II, Technical Information; III, Interpretive Information.

I. THE INVENTORY ITSELF

A. The same interest inventory form should be used for both males and females unless it is shown empirically that separate forms are more effective in minimizing sex bias.

B. Scores on all occupations and interest areas covered by the inventory should be given for both males and females, with the sex composition of norms—i.e., whether male, female, or combined sex norms—for each scale clearly indicated.

C. Insofar as possible, item pools should reflect experiences and activities equally familiar to both females and males. In instances where this is not currently possible, a minimum requirement is that the number of items generally favored by each sex be balanced. Further, it is desirable that the balance of items favored by each sex be achieved within individual scales, within the limitations imposed by validity considerations.

D. Occupational titles used in the inventory should be presented in gender-neutral terms (e.g., letter carrier instead of mailman), or both male and female titles should be presented (e.g., actor/actress).

E. Use of the generic *he* or *she* should be eliminated throughout the inventory.

II. TECHNICAL INFORMATION

A. Technical materials provided by the publisher should describe how and to what extent these guidelines have been met in the inventory and supporting materials.

B. Technical information should provide the rationale for either separate scales by sex or combined-sex scales (e.g., critical differences in male-female response rates that affect the validity of the scales vs. similarity of response rates that justify combining data from males and females into a single scale).

C. Even if it is empirically demonstrated that separate inventory forms are more effective in minimizing sex bias, thus justifying their use, the same vocational areas should be indicated for each sex.

D. Sex composition of the criterion and norm groups should be included in descriptions of these groups. Furthermore, re-

porting of scores for one sex on scales normed or constructed on the basis of data from the other sex should be supported by evidence of validity—if not for each scale, then by a pattern of evidence of validity established for males and females scored on pairs of similar scales (male normed and female normed for the same occupation).

E. Criterion groups, norms, and other relevant data (e.g., validity, reliability, item response rates) should be examined at least every 5 years to determine the need for updating. New data may be required as occupations change or as sex and other characteristics of persons entering occupations change. Text manuals should clearly label the date of data collection for criterion or norm groups for each occupation.

F. Technical materials should include information about how suggested or implied career options (e.g., options suggested by the highest scores on the inventory) are distributed for samples of typical respondents of each sex.

G. Steps should be taken to investigate the validity of interest inventories for minority groups (differentiated by sex). Publishers should describe comparative studies and should clearly indicate whether differences were found between groups.

III. INTERPRETIVE INFORMATION

A. The users manual provided by the publisher should describe how and to what extent these guidelines have been met in the inventory and the supporting materials.

B. Interpretive materials for test users and respondents (manuals, profiles, leaflets, etc.) should explain how to interpret scores resulting from separate or combined male and female norms or criterion groups.

C. Interpretive materials for interest inventory scores should point out that the vocational interests and choices of men and women are influenced by many environmental and cultural factors, including early socialization, traditional sex-role expectations of society, home-versus-career conflict, and the experiences typical of women and men as members of various ethnic and social class groups.

D. Manuals should recommend that the inventory be accompanied by orientation dealing with possible influences of

factors in C above on men's and women's scores. Such orientation should encourage respondents to examine stereotypic "sets" toward activities and occupations and should help respondents to see that there is virtually no activity or occupation that is exclusively male or female.

E. Interpretive materials for inventories that use homogeneous scales, such as health and mechanical, should encourage both sexes to look at *all* career and educational options, not just those traditionally associated with their sex group, within the broad areas in which their highest scores fall.

F. Occupational titles used in the interpretive materials and in the interpretation session should be stated in gender-neutral terms (e.g., letter carrier instead of mailman) or both male and female titles should be presented (e.g., actor/actress).

G. The written discussions in the interpretive materials (as well as all inventory text) should be stated in a way which overcomes the impression presently embedded in the English language that (*a*) people in general are of the male gender and (*b*) certain social roles are automatically sex linked.

H. The users manual (*a*) should state clearly that all jobs are appropriate for qualified persons of either sex and (*b*) should attempt to dispel myths about women and men in the world of work that are based on sex-role stereotypes. Furthermore, ethnic occupational stereotypes should not be reinforced.

I. The users manual should address possible user biases in regard to sex roles and to their possible interaction with age, ethnic group, and social class, and should caution against transmitting these biases to the respondent or reinforcing the respondent's own biases.

J. Where differences in validity have been found between dominant and minority groups (differentiated by sex), separate interpretive procedures and materials should be provided that take these differences into account.

K. Interpretive materials for respondent and user should encourage exploratory experiences in areas where interests have not had a chance to develop.

L. Interpretive materials for persons reentering paid employment or education and persons changing careers or entering postretirement careers should give special attention to score interpretation in terms of the effects of years of stereotyping and home-career conflict, the norms on which the

scores are based, and the options such individuals might explore on the basis of current goals and past experiences and activities.

M. Case studies and examples presented in the interpretive materials should represent men and women equally and should include but not be limited to examples of each in a variety of nonstereotypic roles. Case studies and examples of mature men and women and of men and women in different social class and ethnic groups should also be included where applicable.

N. Both users manuals and respondents materials should make it clear that interest inventory scores provide only one kind of helpful information, and that this information should always be considered together with other relevant information —skills, accomplishments, favored activities, experiences, hobbies, influences, other test scores, and the like—in making any career decision. However, the possible biases of these variables should also be taken into consideration.

NOTES

1. For a comprehensive analysis of the many forms in which sex bias appears in written materials, the reader is referred to the guidelines of Scott, Foresman and Company (1972).

2. An alternative interpretation of sex bias has been suggested by Dale Prediger and Gary Hanson. It defines sex restrictiveness in interest inventory reporting procedures and indicates under what conditions sex restrictiveness is evidence of sex bias. In summary, it can be stated as follows:

> An interest inventory is sex-restrictive to the degree that the distribution of career options suggested to males and females as a result of the application of scoring or interpretation procedures used or advocated by the publisher is not equivalent for the two sexes. Conversely, an interest inventory is *not* sex-restrictive if *each* career option covered by the inventory is suggested to similar proportions of males and females. A sex-restrictive inventory can be considered to be sex-biased unless the publisher demonstrates that sex-restrictiveness is a necessary concomitant of validity.

Still another interpretation has been suggested by John L. Holland:

> An inventory is unbiased when its experimental effects on female and male respondents are similar and of about the same magnitude—that is, when a person acquires more vocational options, becomes more certain, or learns more about himself (herself) and the world of work. . . . The principles can be extended to any area of bias by asking what differences proposed revisions of inventories, books, teacher and counselor training would make.

REFERENCES

American Psychological Association. *Standards for educational and psychological tests.* Washington: Author, 1974. (Available from the American Psychological Association, 1200 17th St., NW., Washington, D.C. 20036; $5 for nonmembers, $3 for members.)

Equal Employment Opportunity Commission. Guidelines on employee selection procedures. *Federal Register*, Vol. 35, No. 149.

Scott, Foresman and Company. *Guidelines for improving the image of women in textbooks.* Glenview, Ill.: Author, 1972. (Available from Scott, Foresman and Company, 1900 E. Lake Ave., Glenview, Ill. 60025.)

Title IX, Education Amendments of 1972. Public Law 92-318, June 23, 1972.

Impact of Interest Inventories on Career Choice /1

Nancy S. Cole and Gary R. Hanson
THE AMERICAN COLLEGE TESTING PROGRAM

ACKNOWLEDGMENTS

Several of the issues in this paper have been discussed with our colleagues Dale J. Prediger, Melvin R. Novick, and Leo A. Munday over a period of several years. In particular, our thoughts about exploration in career guidance have been greatly influenced by Dale Prediger, who also provided many helpful suggestions on the manuscript, and our description of the various technical problems inherent in the people-similarity approach derives from arguments advanced by Melvin Novick in many discussions. While we are greatly indebted for the benefit of these insights, the particular formulation of ideas presented here is of course our sole responsibility.

N.S.C.
G.R.H.

ABSTRACT

This paper begins with two fundamental questions: What are interests and why do we measure them? The answers provided are that interests are a constellation of likes and dislikes leading to consistent patterns or types of behavior, and we measure them in order to predict some types of job satisfaction. Our theories of what interests are, however, tell us very little about how interests are linked to satisfaction. These issues are judged especially important in measuring women's interests because the prominent methodologies for interest measurement (the similarity of a person to people in an occupational group or the similarity of liked activities to activities required in an occupation) have possible severe limitations in predicting job satisfaction for women.

The authors argue that we are at a time in which present data do not tell us how to validly proceed with measuring women's interests. In the interim we are forced to accept one of two working hypotheses: either (1) the socialization of a woman's past will dominate and limit her to satisfaction in the limited range of careers acceptable in the past or (2) expanded career opportunities will dominate and women will find satisfaction in a wide range of careers in spite of past socialization. The authors strongly favor the interim use of the second hypothesis because they view it as less potentially destructive if wrong, especially when interest inventories are viewed as a stimulus to further career exploration within a broader career-guidance process.

Finally, within this context, the authors argue that interest inventories should be expected to demonstrate, as a kind of interim validity, that they broaden the exploratory options for both sexes and that they stimulate exploratory behavior. These interim requirements should not, however, replace the more basic need for research to better understand the relation of interest to types of job satisfaction.

INTRODUCTION

New situations and events often force reexamination of established institutions and beliefs. For example, the two decades following the 1954 Supreme Court decision on school desegregation have been marked by the reevaluation of societal institutions and beliefs in the light of increased awareness of the needs and rights of minority racial-ethnic groups. More recently, but with potential effects no less dramatic, the women's movement has aroused consciousness of another set of injustices and again forced reexamination of previously unquestioned actions and beliefs. Because of the power that derives from a person's occupation in this society, through both money and status, a focal area of the women's movement has been the career opportunities of women. One specific concern in this area is the effect that interest inventories have on women's career choices and, in particular, the possibility of a negative, limiting effect.

Thus interest measurement has become one of those established institutions whose basic tenets require scrutiny and reexamination. It is the purpose of this paper to raise again, in the light of our current understandings, questions about the principal objectives of interest measurement and the assumptions, rationales, or theories on which it is based, and to examine the implications of those objectives and assumptions for the career choices of women and men in a time of social flux and change.

INTEREST MEASUREMENT IN PERSPECTIVE

The problems, issues, and concerns that are emerging with regard to interest measurement are many and complex. Our own ideas and opinions on these topics have been in a state of change for several years and we doubt that the ideas in this paper will represent our final thoughts. At this point in our thinking we have been forced to reconsider some very fundamental aspects of interest measurement: what are interests and why are we trying to measure them? We believe such reconsideration is basic to an examination of the questions that relate to the usefulness or bias of interest inventories. Therefore we begin this paper by examining interest measurement in the perspective of its historical theories, purposes, and methods.

WHAT ARE INTERESTS?

William James was one of the first psychologists to deal with the concept of interest. To James,

> Only those items which I notice shape my mind—without selective interest, experience is an utter chaos. Interest alone gives accent and emphasis, light and shade, background and foreground—intelligible perspective, in a word [1890, p. 403].

Thus James saw interests as a cognitive function of the mind, instrumental in selecting and organizing an individual's experience.

Kitson (1925) perceived the concept of interest in terms of the psychological constructs of "identification" and "self." To Kitson,

> To be interested in a thing is to endeavor to identify one's self with it [p. 141].

In a classic review of interest measurement, Fryer (1931) distinguished between "subjective" and "objective" interests. Subjective interests were defined as *feelings* of pleasantness and unpleasantness toward certain experiences, and objective interests as observable *reactions* to such experiences. Both subjective and objective interests were viewed as acceptance-rejection activities.

In discussing interests, W. V. Bingham (1937), head of a group of individual psychologists at the Carnegie Institute of Technology, defined an interest as a tendency to become absorbed in an experience and to continue in it:

> We therefore define interest not only in terms of the objects and activities which get attention and yield satisfaction, but also in terms of the strength of the tendencies to give attention to and seek satisfaction in these competing objects of interest [p. 62].

Strong's early conception of interests revolved around an empirical definition based on the differentiation of men in various occupations by the Strong Vocational Interest Blank. Later, however, in the introductory chapter of *The Vocational Interests of Men and Women*

(1943), Strong presented his views on the nature of interests somewhat differently. Simply stated, his definition of interests was as follows:

> They [interests] point to what the individual wants to do, they are reflections of what he considers satisfying [p. 19].

In more recent work Strong stated:

> What are interests? . . . They remind me of tropisms. We go toward liked activities, go away from disliked activities [1960, p. 12].

> Interest scores measure a complex of liked and disliked activities selected so as to differentiate members of an occupation from nonmembers. Such a complex is equivalent to a "condition which supplies stimulation for a particular type of behavior," i.e., toward or away from participation in the activities characteristic of a given occupation. Interest scores are consequently measures of drives [1955, p. 142].

The concept of interest was further refined by Carter (1944), who extended the concept of interest to include the ideas of "developmental growth," "the self-concept," and "identification." The main impact of his ideas can be gleaned from the following sample of his writing:

> . . . the individual derives satisfaction from the identification of himself with some respected group; by this method he seizes some sort of status. This identification leads to an interest in restricted activities and experiences; to the extent that this is true the person learns about the vocation and the vocational group [p. 185].

Darley (1941) suggested that interest types represented outgrowths of personality development and that occupational selection and elimination were functions of personality type as well as functions of abilities or aptitudes. Darley concluded that—

> . . . occupational interest types grow out of the development of the individual's personality [p. 65].

The concept of interest type was further elaborated by Bordin (1943) in terms of self-concept and identification. He maintained that in answering an interest inventory an individual expresses his acceptance (or rejection) of a particular view or concept of himself in terms of his occupational stereotypes. For Bordin, interests encompass certain patterns of likes and dislikes that are expressions of personality, and as the self-concept fluctuates and changes so too will the pattern of likes and dislikes.

A somewhat different approach to the concept of interest has been provided by Berdie (1944):

> When interests are considered as expressions of liking and disliking, attention can be paid to the objects liked or disliked. These objects form constellations; they have characteristics in common that enable us to place them in classes [p. 153].

Berdie maintained that such constellations are relatively constant and can be considered fundamental aspects of personality. The specific interests or objects involved in the constellations can change and learning and emotional experiences can affect them, but the constellations (or patterns of interest) themselves are not as susceptible to experience and are probably determined by constitutional and early social factors.

Super (1949) formulated a conceptual definition much like Bordin's:

> Interests are the product of interaction between inherited aptitudes and endocrine factors on the one hand, and opportunity and social evaluation on the other. Some of the things a person does well bring him the satisfaction of mastery or the approval of his companions, and result in interests. Some of the things his associates do appeal to him and, through identification, he patterns his actions and interests after them; if he fits the pattern reasonably well he remains in it, but if not he must seek another identification and develop another self-concept and interest pattern [p. 406].

Holland's view of interests can be seen in the following excerpts from a recent book (Holland, 1973a):

> In short, what we have called "vocational interests" are simply another aspect of personality [p. 7].

> Just as we are more comfortable among friends whose tastes, talents, and values are similar to our own, so we are more likely to perform well at a vocation in which we "fit" psychologically . . . . In the present theory, the congruence of a person and his environment is defined in terms of the structure of personality types and environmental models [p. 9].

In summary, we can note several important common features of these conceptions of interest. First, they are a constellation of likes and dislikes leading to consistent patterns or types of behaviors. Second, they may involve some mix of genetic and environmental causes, but they are certainly related to environmental influences. Third, although the explanations of interest relate to satisfaction with activities,

they are not derived from a clear explication of the link between interests and satisfaction.

WHY MEASURE INTERESTS?

As described in the preceding section, interests are a pervasive part of a person's personality and an important guide to behavior. For this reason alone, it would be "interesting" to these theorists to measure interests. We are concerned here, however, not with researchers or theorists but with the implications of interest measurement for the people whose interests are being measured. When interest measures are used as feedback to such people, the basic goal or purpose of the interest measurement has been clear, even when only implicitly stated. *That goal has been to provide people with information that would help them identify careers in which they would be satisfied.* The word *satisfied* is used here to refer to various forms of satisfaction, including happiness and personal fulfillment.

Strong (1943) indicated this important link between interests and happiness or satisfaction:

> The more happiness is stressed, and not mere efficiency, the more concern educators must have for interests; for they are indicators of what activities bring satisfaction [p. 3].

The same basic goal remains today, as can be seen from Campbell (1971):

> The Strong Blank is designed to help guide the student and the employee into areas where they are likely to find the greatest job satisfaction [p. 2].

Similarly, according to Kuder (1968):

> Interest scores . . . can be used to help [an individual] set goals likely to bring him personal fulfillment [p. 3].

INTERESTS AND SATISFACTION

Interests have been defined in varying ways: characteristic constellations of likes and dislikes, patterns of behavior, drives, self-concepts, or personality. The basic goal of measuring interests has been given as providing information to help identify occupational situations which will be satisfying and those which will not. Thus we must examine the link between interests as a characteristic of a person and the occupational environment as a source of a variety of types of satisfaction. As can be seen from the foregoing discussion of interests, this link is elusive at best.

The link between interests and satisfaction is provided by a primary theoretical theme of vocational psychology: that congruence between an individual and the environment leads to satisfaction in a job. This theme can be seen in different forms in both trait and factor theories and psychodynamic theories, the two lines in the historical development of vocational psychology identified by Crites (1969). The roots of the theme can be seen in the man-job matching model of Parsons (1909), and it has been emphasized in the writings of numerous other authors (e.g., Dawis, England, & Lofquist, 1964; Holland, 1966, 1973a).

Though espousing the congruence notion, interest inventory developers have not been directly concerned with the relation between personal and environmental characteristics. Instead, interest measures have been built around personal characteristics alone—namely, constellations of likes and dislikes that describe a person's behavior pattern or personality type. Thus the problem of the link between measured interests and job satisfaction remains a central problem for interest-measurement methodology.

INTEREST MEASUREMENT METHODS

In this section we briefly survey the dominant rationales for interest-measurement methods and how they provide the link to job or career satisfaction, the stated basic goal.

People-similarity rationale. Historically, the dominant method of interest measurement has derived from the observation that people in the same job have similar characteristics, similar likes and dislikes. As Darley and Hagenah (1955, p. 19) noted, "The most general clue to an understanding of interest measurement is found in the old adage that birds of a feather flock to-

gether." From this occurrence a logic or rationale for interest measurement can be stated:

> *Rationale 1.* If a person likes the same things that people in a particular job like, the person will be satisfied with that job.

According to this rationale, one measures the degree of similarity between a person's likes and dislikes and those of people in a number of jobs and concludes that the person will likely be most satisfied in the job for which the similarities are the greatest. The two dominant interest inventories, the Strong Vocational Interest Blank (SVIB) and the more recent Kuder Occupational Interest Survey (OIS), are implementations of this rationale. For simplicity of discussion, it will be referred to in this paper as the people-similarity rationale.

As stated, the people-similarity rationale is more an empirical observation than a rationale. And, in fact, interest measurement in its most widely used forms (the SVIB and the OIS) has been primarily an empirical science. Although the question "Why is a person who has interests similar to those of people in a job likely to be satisfied with that job?" has not been entirely ignored, it has received far less attention than the observation itself that such a person is likely to be satisfied. The apparent answer to this very basic question "Why?" can be gleaned from the conceptions of interest described above: People who stay in and are satisfied with a particular job do so because the job provides an environment that is, in some unspecified way, congruent with their constellation of likes and dislikes. Thus a person with interests similar to those of such people would have similarly congruent interests for that job environment.

Activity-similarity rationale. A derivative of the people-similarity rationale that has received greater emphasis in recent years could be called the activity-similarity rationale. In its purest form, this rationale answers the question "Why?" that intervenes between similarity and satisfaction in a very direct way.

> *Rationale 2.* If people like activities similar to the activities required by a job, they will like those job activities and consequently be satisfied with their job.

Under this rationale, one measures a person's likes and dislikes for common activities similar to those required on a job and concludes that the person will probably be most satisfied in the job requiring activities similar to those which the person now most likes to do.

A number of recent efforts have placed great emphasis on types of activities as they relate to job activities. The Ohio Vocational Interest Survey (D'Costa, Winefordner, Odgers, & Koons, 1970) emphasizes the data, people, things dimensions of job activity and uses actual job activities from the *Dictionary of Occupational Titles.* Holland's Self-Directed Search (Holland, 1973a) classifies past job-related activities into categories derived from and related to the structure of the world of work. Prediger and Roth (in press) provide a direct link from a job-activity orientation to a personality orientation seen in the structure of interests pervasive in present interest measures (Cole & Hanson, 1971; Holland, Whitney, Cole, & Richards, 1969). And recent interest inventory development at The American College Testing Program (ACT, 1974; Hanson, in press) has relied on common, familiar activities with an apparent relation to job activities as the basis for two new inventories. None of these approaches, however, relies on a pure form of the activity-similarity rationale. Instead, activities have been used more as an indicator of the constellation or type of personality of the person than as a direct indicator of likely satisfaction with particular job activities.

HOW HAVE INTEREST MEASURES BEEN VALIDATED?

If the basic goal of interest measurement is to relate to the many aspects of job satisfaction, the obvious way to validate interest measures is to empirically relate them to measures of job satisfaction. In fact, each of the two rationales described suggests a different ideal validation.

People-similarity validation. For the first rationale, based on people similarity, the obvious validation procedure is to relate interest scores to measures of satisfaction on the job. However, a number of problems immediately arise. First,

the concept of job satisfaction is complex and difficult to measure. As Strong (1958) observed,

> Years ago I contended that there was "no better criterion of a vocational interest test than that of satisfaction enduring over a period of years [p. 385]." . . . I have never used satisfaction as a criterion on the ground that there seemed to be no good way to measure it. Such correlations as have been reported between interest scores and satisfaction have been for the most part too low to be of practical significance [p. 449].

Strong was no exception in having these views, and today interest inventories have still not used measures of job satisfaction as criteria for validation (except in terms of global satisfaction ratings in defining occupational criterion groups), just as the rationales of interest measurement have not directly involved the why and how of job satisfaction. But the measurement of job satisfaction has progressed over the years, and we believe a fruitful area for future research is a more thorough examination of the relation of interests to various sources of job satisfaction (some of which we would expect to be related to interests and others not).

A second problem with this ideal validation concerns the prediction of relative satisfaction in different occupations when people can be in only one occupation (or a very few occupations) at one time. Thus we can usually observe only the degree of relationship of the interest scores to satisfaction in one job—the one the person has chosen to enter.

Because of these problems with these ideal validations, interest inventories have been validated in terms of group membership. Strong (1943) listed four propositions needed to establish the predictive value of his vocational interest measures (p. 388):

1. Men continuing in occupation A obtain a higher interest score in A than in any other occupation.
2. Men continuing in occupation A obtain a higher interest score in A than other men entering other occupations.
3. Men continuing in occupation A obtain higher scores in A than men who change from A to another occupation.
4. Men changing from occupation A to occupation B score higher in B prior to the change than in any other occupation, including A.

All four conditions rely on the occupational group to which a person belongs as an implicit indicator of the job in which that person would be most satisfied. And, in fact, empirical results have tended to confirm that people's interest scores (whether on occupational scales or general scales) are consonant with the occupation in which they are employed and with which they state a general level of satisfaction.

The group-membership criterion poses an important technical problem aside from the fact that it only indirectly addresses job satisfaction. The problem is that social influences can make the relation between interests and group similarity high even when people would have been much happier in other occupations. As long as the society channels people with particular characteristics into particular occupations, interest inventories validated against group membership will be considered highly valid whether or not the people in an occupation are happier than they would be in other occupations and whether or not there are many people with other characteristics who could be happiest in that occupation.

Activity-similarity validation. Under the activity-similarity rationale, an inventory measures the liking of a person for activities related to job activities. Thus the first step in ideal validation is to relate empirically the inventoried likes and dislikes for common, familiar activities with the likes and dislikes for actual job activities. Since the common goal is to relate to job satisfaction in a more global sense, the second step is to discover the extent to which liking particular job activities is important to more general job satisfaction. Although the purpose of inventorying likes and dislikes for such activities has commonly been to indicate general personal characteristics, as in the people-similarity procedures, it would appear to us to be very useful to perform some of the steps of the ideal activity-similarity validation to learn more about the relative importance of various sources of job satisfaction and the link to interests.

NEW PROBLEMS FOR INTEREST MEASUREMENT

The perspective of interest measurement given in the preceding section involves additionally two dominant elements not yet discussed. First, interest measurement has been predominantly developed by, for, and about men. Conceptions of interests have been largely based on data about men's interests; interest-measurement methodology has arisen out of interest measures on men; and interest measures have been validated primarily on men. Second, interest measurement has depended on a relatively stable social situation in which no large breaks or changes in the socialization process occur within an individual life history or at a point or period in the society's history.

These two elements raise special problems in the 1970's. First, we are clearly concerned with women as well as men and we must examine the applicability for women of approaches based on men. Second, we are in a time of a rather dramatic break in the continuity of the socialization process for women as it relates to careers, self-concepts, and occupational roles. Thus we must examine interest-measurement approaches in the light of this discontinuity. In this section we examine some of these new problems for interest measurement.

PROBLEMS WITH THE PEOPLE-SIMILARITY METHOD

The people-similarity rationale stated above relies very heavily on a stable socialization process and is tied very closely to the past. Two special problems of this method arise from its highly empirical orientation and its reliance on the status quo.

Limits of empiricism. Interest measurement has historically been a highly empirical science. The thing we know most about it is that it has tended to work in the past. We know much less about why it has worked. To know something has worked in the past is very useful as long as the future is like the past. When the future is dramatically different, then we need to know *why* something has worked in the past in order to judge if and how it might work in the future. Thus the empiricism of interest measurement, which has been one of its great strengths, is, we believe, at this time in history a weakness.

Reliance on the status quo. The people-similarity methodology, which uses group membership as its primary criterion, relies heavily on the status quo. The group-membership criterion, which undoubtedly properly includes elements of satisfaction (groups are usually limited to those expressing some level of satisfaction), also may, and almost certainly does, include elements extraneous to job satisfaction but resulting from the existing social situation. For example, when a physician scale is constructed by the people-similarity method, the scale is defined by the likes and dislikes of current (at the time of construction), satisfied physicians. Since in the past many physicians have come from relatively high socioeconomic status (SES) backgrounds, the Physician scale of the Strong, for example, reflects these backgrounds, as can be seen from the following list of selected positively scored items from the SVIB Physician scale for men, from Campbell (1971). (The entire SVIB Physician scale for men includes a total of 76 items: 8 amusements, 22 occupations, 12 school subjects, 6 types of people, 9 activities, 13 preferences between items, 6 abilities and characteristics.)

Amusements: tennis; chess; bridge; art galleries; symphony concerts; skiing
Occupations: orchestra conductor
School subjects: literature
Types of people: musical geniuses

Although these items might relate to one's satisfaction in associating with people with similar high SES interests, they seem highly questionable as interests essential to satisfaction as a physician, especially when the field of medicine itself is taking steps to break this traditional physician mold and encouraging the enrollment of a more diversified group of students.

In the case of women, the problem of reliance on the status quo becomes especially pronounced. It appears in obvious fashion in the lack of some occupational scales for women. Under the status quo there are many occupa-

tions with few or no women in them, and therefore under the people-similarity method the potential of women for satisfaction in these jobs cannot be predicted.

PROBLEMS WITH THE ACTIVITY-SIMILARITY METHOD

Although the activity-similarity method avoids some of the problems of the people-similarity method by relying on the activities required on a job rather than the people who happen to be in the job, it raises a different set of problems.

Experiental effects on interests. The activity-similarity method relies on people's liking or disliking common activities similar to those required on jobs. However, the socialization process results in quite different exposure to activities by men and women. For example, in a nationwide study, Prediger, Roth, and Noeth (1973) found wide differences in the career-related experiences reported by girls and boys in grades 8, 9, and 11. These data indicated that the expressed interests of men and women in such activities differ markedly in ways that parallel the experiential differences. Thus, while we know that only 17 percent of the 1969 Strong Women-in-General sample (Campbell, 1971, p. 403) liked "repairing electrical wiring," we do not know whether more would have liked it if the social setting encouraged rather than restricted such an activity for girls or, more importantly, whether more girls would learn to like it if they were encouraged. Because of the differences in socialization, *not liking* an activity might have quite a different meaning for a boy who had tried it and been "allowed" to like it than for a girl whose socialization ruled it out. The activity-similarity method therefore must deal, in general, with the differences in socialization, and, in particular, with their implications for predicting job satisfaction.

PROBLEM OF SEX DIFFERENCES

The types of items that have historically appeared in interest inventories are subject to systematic sex differences. The previously noted "repairing electrical wiring" is a case in point. In contrast with 17 percent of the women, as cited above, 39 percent of the 1969 Strong Men-in-General sample reported liking that activity (Campbell, 1971, p. 400). Because of these sex differences, occupational scales were constructed separately by sex, masculinity-femininity scales based on items that differentiated the sexes came into being, and even separate forms of the inventory were constructed. There are, however, pitfalls into which this historical pattern has led us.

First, in the case of empirically constructed occupational scales, the historical pattern has limited the information an inventory provides women, since occupational scales are based on people already in occupations and many occupations have few women. For the same reason there are similar but fewer restrictions on the information given men. By leading us to separate the sexes in this way, this historical pattern has limited the direct comparison of men and women in many occupations (e.g., auto mechanic, nurse) to determine to what extent there are differences in likes and dislikes and whether there are crucial likes and dislikes, regardless of sex, in relating to job satisfaction. Thus we are left knowing that there are sex differences presently without knowing their relevance or irrelevance or their implications for predicting job satisfaction.

There are similar problems with scales measuring general-interest dimensions such as those of Holland. Holland has documented sex differences on his logically based scales and argued (1974) that he is intentionally measuring the socialization process, which differs now for girls and boys and results in different interests. We agree that he is measuring the socialization process and that it does now differ for girls and boys. We doubt, however, that Holland's basic intention is to measure the socialization process per se, as can be seen from the statement, "The SDS provides a method for locating groups of occupations where a person is most likely to find satisfaction [1973b, p. 1]."

We believe to be unanswered the question whether the socialization process for girls is as predictive of job satisfaction as the same proc-

ess for boys when girls have not been socialized to examine as wide a range of possible interests as boys and yet rather suddenly have access to that full range. The dilemma as we see it is presented graphically in figure 1. In the past (cases 1 and 2) the socialization process matched the career process in terms of the range of experiences and options. If we are in a state of transition, as we believe, the present (cases 3 and 4) can be illustrated by a mismatch: career options are opening before the early socialization process can be changed accordingly. Although hopefully the future could be characterized by the full circle of options for both sexes, that situation will not be reached immediately. In the interim we must make some decisions and take some kind of action.

Although the implications of the situations depicted in cases 3 and 4 of figure 1 are unknown, at least two different hypotheses on which to base action are possible. One hypothesis derives from the argument of Holland noted above and will be discussed here as the hypothesis of socialization dominance.

> *Hypothesis of socialization dominance.* Until the areas of socially accepted interest options become broadened during a person's development, the careers in which such people will be satisfied will not broaden.

An alternative hypothesis emphasizes the importance of career opportunities rather than socialization. This hypothesis is implicit in the work of Cole (1973) on the structure of women's interests and will be referred to here as the hypothesis of opportunity dominance.

> *Hypothesis of opportunity dominance.* When career opportunities widen, people will find satisfaction in a wider range of careers in spite of limiting aspects of their earlier socialization.

Although neither hypothesis can be proved at this time, the one to which a person subscribes has important implications for the treatment of sex differences in interest measurement.

Basically, the sex difference problem raises an issue that has been emphasized throughout this paper—that the goal of interest measurement is to predict satisfaction in a job or career. Because the methodology and the validation of interest measurement are only indirectly related to that goal, it is easy to replace that goal with the prominent means, similarity of people or activities, and the similarity methodology tends by its nature to support the hypothesis of socialization dominance. But the problem of sex differences forces us to recall the more basic goal. Men and women are not now similar in all their likes and dislikes, but an unanswered question is which of those dissimilarities are directly related to satisfaction or dissatisfaction. When we recognize this goal of predicting satisfaction, it becomes clear that we do not know which hypothesis is correct. Since our actions are likely to be based on one or the other, in the interim we must judge the value of the two hypotheses not by their correctness but by the results of the action to which they lead.

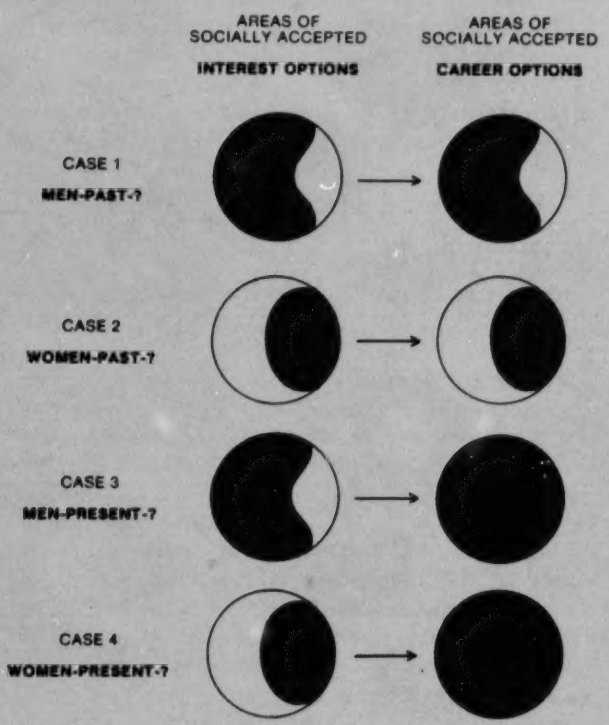


FIGURE 1.—A graphical representation of the correspondence of the socialization process with the career options available to men and women.

PROBLEMS OF NORMS AND REFERENCE GROUPS

One of the important implications of the two hypotheses concerns the norms or reference groups used in interest inventories. Holland reports interests as raw scores. No norm or reference group is used. Instead the reference is the logical basis of the items. This results in scales that reflect the socialization process very clearly, and women tend to score highest on the Social and Artistic scales and very low on the Realistic scale. Such score reporting is consistent with the hypothesis of socialization dominance.

By contrast, recently developed interest instruments at The American College Testing Program (as part of the ACT Career Planning Program and the ACT Assessment) and the much older Kuder Preference Record homogeneous scales use a different approach consistent with the opportunity-dominance hypothesis. For those inventories the raw general scale scores are compared with norms of the same sex as the person taking the inventory. Thus a woman's score on a Technical scale, which may be low when compared with scores of men, is reported as high if it is higher than the Technical scores of most women. The logic here is that for each occupation in the full range of occupations there will be some women who will be able to find satisfaction in it (hypothesis of opportunity dominance), and the best bets in the previously unentered areas are those women who have higher interests than the mean produced by the socialization process. Some support for these procedures is found in the structure of women's interests reported by Cole (1973), in which referencing women's scores to women's norms produced the full range of interest patterns and occupational profiles; these, where comparable, closely paralleled the occupational profiles based on men's interest scores.

These two cases are based on the use of general interest scales. Occupational scales present even greater problems, although in somewhat different forms. The application of the socialization-dominance hypothesis would lead to the continued use of available occupational scales for women along with the construction of new occupational scales as women entered new occupations in sufficient number. However, both the Strong (at least, the new Strong-Campbell Interest Inventory) and the Kuder Occupational Interest Survey attempt to broaden the information given by reporting scores for women on occupational scales developed for men, which seems at least a step in the direction of the opportunity-dominance hypothesis. According to the latest information available to us, the Strong-Campbell will report the general Basic scales using a combined-sex reference group that will result in interest patterns more nearly corresponding to Holland's raw score patterns and the socialization-dominance hypothesis than to the same-sex reference patterns.

VOCATIONAL DEVELOPMENT AND CAREER GUIDANCE

Historically, interest inventories have been viewed as a source of information input at the time of career-choice decisions. Career choice was often viewed as an "event" occurring at a single point in time. Thus students who had to select a college major or decide on a job might go to a college counselor, take an interest inventory, and try to make a decision. The inventory was designed to assist in making such a choice at a pressing decision point.

Today, however, the prevailing view of career decisions and career guidance is distinctly different. First, career decisions are viewed not as an event but as part of a process that begins very early in a child's development and continues throughout life in a variety of career-decision activities. Career-education programs being developed for the schools emphasize these developmental aspects and are designed to promote career-related experiences—both "hands on" and vicarious—in the full range of career options. Career knowledge and exploration are emphasized in the schools with the basic goal of avoiding sudden, pressured "choices" at a time when some decision must be reached. Such programs of career education and career guidance offer many helpful possibilities in the broader experiences they provide and encourage for women at a time of transition.

Career guidance as it exists today emphasizes the use of information, including interest inven-

tories, to stimulate career exploration and the exploration of self in relation to careers (Prediger, 1974). This process of exploration should lead people to discover new things about themselves and about the world of work. Using such information, people can begin to consider a broader range of career options. The usefulness of this type of stimulation is that it provides focused exploration. Appropriate use of interest inventories with women may well lead to focused exploration in totally new areas.

Career-guidance programs also emphasize the importance of transforming guidance information into action. That is, interest inventories should no longer be merely reported or interpreted. They should change behavior. The change may take the form of students seeking new job experiences, involving parents in their career decisionmaking, and participating in volunteer work experiences. Thus there are new problems and altered roles for interest inventories in this broadly conceived career-guidance framework.

WHERE DO WE GO FROM HERE?

A primary feature of the perspective emerging from the preceding section is the lack of simple answers to the difficult problems raised. There are, however, both discouraging and encouraging elements to be noted. The following statements are representative of our present beliefs after a reexamination of basic tenets and methods.

1. Interests still seem to us to be an important concept, with considerable potential value for understanding differences between people and their characteristic ways of behaving. Further, we suspect that interests will continue in the future to relate in many meaningful ways to various types of career satisfaction.
2. We believe that the goal to provide people with information that will help them choose careers in which they will be happy and satisfied is timely and worthy. The need to open wider career options for women and for men makes the goal perhaps even more important than before.
3. We believe that present interest measures give important information about characteristic patterns of likes and dislikes and their historical occupational membership correlates.
4. We feel that if the link between interests and job satisfaction had been more explicitly examined during the last quarter century, then we would know more now about predicting job satisfaction in a changing social environment and in particular about predicting job satisfaction for women.
5. We believe that we are in a situation in which many basic questions about validity of interest inventories cannot yet be answered completely or well. In the interim we must make decisions with incomplete information.

When we are in a situation of not knowing what action is "valid" in terms of ultimate goals, possible courses of action must be evaluated in terms of possible advantages and disadvantages. One possible course of action would be to stop using interest inventories until we know more about the implications of recent social change for their ultimate validity. This action would avoid possible wrong predictions, but it would also eliminate any possible positive role inventories might play. Another course would be to continue to use inventories but to take whatever actions are necessary to minimize the possible negative effects. The remainder of this paper deals with interim actions designed to maximize positive and minimize possible negative effects and the assumptions on which these actions are based.

A PROPOSED CONTEXT FOR INTEREST INVENTORY USE

In an earlier section we described current conceptions of vocational development and the career-education and career-guidance programs that correspond to those conceptions. According to these views, career guidance occurs as a process rather than at a single decision point, involves providing a person with career experiences of various types and with information about self and careers, and emphasizes the importance of exploration behavior in the career-decision process. Prediger (1974) has focused on this important role of career exploration in the

career-guidance process. Within that context he views tests or inventories primarily as stimuli to that exploration.

We believe that implementation of a broad career-exploration program provides the proper context in which interest inventories can serve a very valuable role as a stimulus for exploration. Such a use of interest inventories provides an interim course of action that maximizes the benefits of the inventories and minimizes the possible detriments.

Our belief in the value of this interim course of action is based on at least three assumptions. The first assumption is that people need some form of stimulus or organizing assistance in making career plans. Second, the best way for people to make judgments (or predictions) about whether or not they will be satisfied in an occupation is to obtain all the information they can about themselves and about the occupation. Third, by embedding interest inventory results in a broad career-exploration process in which further exploration follows any inventory results, the negative impact of incorrect inventory predictions can be minimized.

WHAT CAN WE EXPECT AN INTEREST INVENTORY TO DO?

In the context of the career-exploration process, we have two primary expectations for an interest inventory. These two expectations are expressed here as guidelines for interest measurement, with several subordinate guidelines encompassed by the two general areas.

Broadened options. The first area of expectation for interest inventories concerns the broadening of career options:

> 1. Interest inventory scores should suggest occupations that broaden the options of both sexes throughout the full range of career areas.

There are several important aspects of this desired broadening. The first concerns the relation of inventory results to previous job preferences. As we view the career-exploration process, a person with some job preference would explore that job in many ways and on the basis of that exploration would reach some sort of decision about the appropriateness of the job in relation to various personal goals. Thus we view the predominant role of interest inventories as a broadener of options—to suggest reasonable possibilities for exploration that people might otherwise have failed to explore. While a traditional distinction has been made between this exploratory role and a confirmatory role, we place far greater importance on the former. One way to examine the degree to which options are broadened is to compare inventory results with previous job preferences in accord with the following guideline:

> 1a. For a given group, it is desirable that there be some variation between original occupational preferences and inventoried occupational suggestions and that an inventory produce several occupational options for each person.

The second aspect of the broadening of options concerns the type of alternative options an inventory suggests. For example, guideline 1a could be met by the inventory suggestions of "medical technologist" and "dental hygienist" for a woman whose original job preference was "nurse." This type of broadening within sex-career stereotypes is insufficient. Similarly, it is inadequate to broaden options only within sex-related career areas—for example, by suggesting primarily social types of occupations for women.

> 1b. Interest inventories should produce approximately equal distributions of scores for men and women throughout the full range of possible general scale and occupational scale scores.

This guideline has important implications for the norming of interest scores. Preliminary data presented in table 1, from a report in preparation at The American College Testing Program, show the distributional implications of three types of general scale scores from the ACT Interest Inventory for the type of two-point codes

TABLE 1.—*Distribution of percentages of Holland codes for women and men for different types of score referencing*

Holland code	Codes based on raw scores		Codes based on separate sex norms		Codes based on combined sex norms	
	W	M	W	M	W	M
Social total	67.3%	26.3%	17.9%	14.3%	28.8%	4.1%
SE	14.3%	6.9%	5.1%	3.8%	6.6%	1.3%
SC	11.3	1.8	2.2	1.5	6.0	0.3
SR	1.6	7.2	2.7	2.2	1.3	1.1
SI	11.8	4.5	3.3	2.4	5.6	0.8
SA	28.3	5.9	4.6	4.4	9.3	0.6
Enterprising total	3.1%	9.6%	13.6%	13.3%	11.1%	14.0%
ES	1.7%	3.8%	2.9%	2.9%	3.4%	2.0%
EC	0.4	2.2	3.8	4.8	2.8	4.3
ER	0.1	1.8	2.0	2.0	0.2	3.9
EI	0.1	0.7	0.9	0.9	0.6	1.5
EA	0.8	1.1	4.0	2.7	4.1	2.3
Conventional total	9.7%	8.7%	18.0%	16.2%	20.0%	11.9%
CS	5.8%	2.5%	2.8%	1.4%	5.4%	0.6%
CE	2.2	2.6	6.8	6.2	7.4	4.6
CR	0.2	2.1	4.8	4.0	1.7	3.9
CI	0.4	1.2	1.8	2.9	2.4	2.2
CA	1.1	0.3	1.8	1.7	3.1	0.6
Realistic total	0.2%	18.9%	14.4%	19.4%	2.8%	35.8%
RS	0.2%	6.1%	1.8%	2.0%	0.7%	2.9%
RE	0.0	2.8	2.2	4.2	0.3	8.7
RC	0.0	2.9	3.2	4.3	0.8	6.5
RI	0.0	5.5	3.8	5.7	0.2	14.5
RA	0.0	1.6	3.4	3.2	0.8	3.2
Investigative total	9.1%	30.0%	19.3%	21.2%	13.5%	24.7%
IS	5.5%	11.7%	4.9%	5.1%	5.2%	2.5%
IE	0.1	1.5	1.2	1.7	0.4	1.7
IC	1.0	2.5	3.3	3.9	2.0	2.7
IR	0.2	10.1	5.1	3.9	1.4	12.8
IA	2.3	4.2	4.8	6.6	4.5	5.0
Artistic total	10.8%	6.4%	16.7%	15.3%	24.1%	9.4%
AS	7.8%	3.2%	5.0%	5.1%	12.0%	2.5%
AE	0.5	0.9	2.8	3.4	4.0	1.8
AC	0.7	0.2	1.9	1.3	3.0	0.8
AR	0.3	0.8	3.8	1.4	1.7	2.5
AI	1.5	1.3	3.2	4.1	3.4	1.8
Grand total	100%	100%	100%	100%	100%	100%

NOTE.—Based on the scores of 3,439 college-bound high school students (2,009 women and 1,430 men) who took the ACT Interest Inventory in October 1972.

used by Holland. Both the raw scores and scores referenced to a norm group composed equally of women and men produce vastly different two-scale code options for women than for men. By contrast, the distributions of codes are quite similar for women and men when separate sex norms are used. Only the scores produced by the separate sex norms meet guideline 1b. With present instruments, people's scores will probably have to be reported in terms of their relation to the distribution of scores obtained by people of the same sex in order to accomplish the balanced distributions required under this guideline.

Thus we come back to the discussion of the hypotheses of socialization dominance and opportunity dominance. Guideline 1b is clearly an expression of the latter hypothesis. As already noted, the validity of either hypothesis is not now known. Therefore guideline 1b is an expression of a belief, first, in the eventual validity of the implied methods of prediction of satisfaction and, second, in the maximal positive aspects and minimal negative aspects of the suggested interim course of action. If the opportunity-dominance hypothesis is supported eventually, inventory results consistent with the socialization-dominance hypothesis will have reinforced incorrect and inappropriate stereotypical views and minimized further exploration. On the other hand, if the socialization-dominance hypothesis is supported, inventory results consistent with the opportunity-dominance hypothesis will have led people to waste time exploring new career areas; but probably nothing more harmful will have occurred, since that exploration should result in the elimination of inappropriate inventory suggestions. Thus we justify 1b by our belief not only in the opportunity-dominance hypothesis but, more importantly, in its high potential for positive social effect and its low potential for negative social effect.

Although we see great social value and minimal harm in expanding options as described, this interim action should not serve as a substitute for more thorough attempts at validation. Further, these validation attempts should not be limited to the people-similarity approaches described earlier in this paper. Instead they should be aimed at the use of interest measures to predict some aspects of job satisfaction or fulfillment. While it will be impossible to validate the predictions of job satisfaction deriving from the two hypotheses within a short time, initial steps should be undertaken and primitive initial types of validating data should be sought. Even crude initial data could give valuable information about the appropriateness of suggesting that a woman consider the occupation electrician, for example.

1c. Tentative, short-term forms of validation should be undertaken to determine user reaction to the appropriateness of inventory results, especially reaction after exploration of the suggested occupation.
1d. Studies of the types of job satisfaction and their relation to vocational interests should be initiated.

Inventories as stimuli. Within our conception of the career-guidance process, interest inventories serve primarily as stimuli to exploration. The second major area of expectation that we have for interest inventories concerns this role:

2. Interest inventory results should stimulate exploratory behavior.

If we expect interest inventories to serve as stimuli, then we must examine the exploratory steps and actions people take as a result of the inventory. Although the study of inventory impact could have been useful and informative at any time in the history of interest measurement, we have found only limited and very recent empirical examinations of such impact. Holland and his colleagues showed concern with the behavioral impact in the design of SDS. Zener and Schnuelle (1972) empirically examined the impact of the SDS on the number and type of occupational options considered. They reported an increase in the number of options considered after the SDS was taken, but no broadening of the type of option. Redmond (1972) reported that both boys and girls were likely to seek more vocational information after the SDS experience.

Note that when the goal is to produce certain types of behavior, then various aspects of an

inventory must be examined in the light of that goal. For example, for the goal of widening options an inventory might result in 40 possibilities. Within the present concern with the behavioral impact, 40 options would probably be overwhelming and produce little exploration. Thus the two goals interact in determining the best characteristics of an inventory. Note also that another implication of trying to produce exploratory behavior concerns the supporting materials and score reports. For this goal such materials should be designed to have maximal impact on exploratory behavior.

In the study of inventories as stimuli, information must be collected about the number and types of jobs explored after inventory use and about the forms that exploratory behavior took. Such studies, though not now available, can be accomplished in reasonable periods of time; they involve no long-term followup, and supporting materials that may influence the results are relatively easy for publishers to modify. Thus we are led to two specific elements of guideline 2:

2a. An interest inventory, its supporting materials, and its score reports should be designed to maximize exploratory action by the person taking the inventory.
2b. Studies should be reported in inventory manuals to show the effect or lack of effect of the inventory on exploratory behavior.

SUMMARY AND CONCLUSIONS

We have described some expectations for interest measurement that can be examined at least in preliminary ways in a short time period. Accomplishment of those expectations will not answer all the ultimate questions about interest inventories as predictors of job satisfaction. It will, however, put us in a position of beginning to answer those questions while maximizing benefits and minimizing ill effects of present procedures.

The usefulness of an interest inventory for any group (different age groups, racial-ethnic groups) can be evaluated in terms of how well the expectations in these two areas are met within that group. If an inventory does not broaden options or produce exploration in the particular group, then we would question its use with that group. Similarly, the appropriateness of any type of interest scale (occupational or general, empirical or logical) would be judged in terms of whether it meets the stated expectations for broadening options and producing exploration.

REFERENCES

American College Testing Program. *Handbook for the ACT Career Planning Program, grades 8-11.* Iowa City: Author, 1974.

Berdie, R. F. Factors related to vocational interests. *Psychological Bulletin,* 1944, 41, 137-157.

Bingham, W. V. *Aptitudes and aptitude testing.* New York: Harper & Row, 1937.

Bordin, E. S. A theory of vocational interests as dynamic phenomena. *Educational and Psychological Measurement,* 1943, 3, 49-65.

Campbell, D. P. *Handbook for the Strong Vocational Interest Blank.* Stanford, Calif.: Stanford University Press, 1971.

Carter, H. D. Vocational interests and job orientation. *Applied Psychology Monographs,* 1944, 2.

Cole, N. S. On measuring the vocational interests of women. *Journal of Counseling Psychology,* 1973, 20, 105-112.

Cole, N. S., & Hanson, G. R. An analysis of the structure of vocational interests. *Journal of Counseling Psychology,* 1971, 18, 478-486.

Crites, J. O. *Vocational psychology.* New York: McGraw-Hill, 1969.

Darley, J. G. *Clinical aspects and interpretation of the Strong Vocational Interest Blank.* New York: Psychological Corporation, 1941.

Darley, J. G., & Hagenah, T. *Vocational interest measurement.* Minneapolis: University of Minnesota Press, 1955.

Dawis, R. V., England, G. W., & Lofquist, L. H. A theory of work adjustment. *Minnesota Studies in Vocational Rehabilitation,* 1964.

D'Costa, A. G., Winefordner, D. W., Odgers, J. G., & Koons, P. B., Jr. *Ohio Vocational Interest Survey.* New York: Harcourt Brace Jovanovich, 1970.

Fryer, D. *The measurement of interests.* New York: Holt, Rinehart & Winston, 1931.

Hanson, G. R. *Assessing the career interests of college youth: Summary of research and applications.* (ACT Research Report No. 64) Iowa City: American College Testing Program, 1974, in press.

Holland, J. L. *The psychology of vocational choice: A theory of personality types and model environments.* Waltham, Mass.: Ginn/Blaisdell, 1966.

Holland, J. L. *Making vocational choices: A theory of careers.* Englewood Cliffs, N.J.: Prentice-Hall, 1973. (a)

Holland, J. L. Sexism, personal development, and the Self-Directed Search. Unpublished paper, Center for Social

Organization of Schools, Johns Hopkins University, 1973. (b)

Holland, J. L. Some guidelines for reducing systematic biases in the delivery of vocational services. *Measurement and Evaluation in Guidance*, 1974, 6, 210-218.

Holland, J. L., Whitney, D. R., Cole, N. S., & Richards, J. M., Jr. *An empirical occupational classification derived from a theory of personality and intended for practice and research.* (ACT Research Report No. 29) Iowa City: American College Testing Program, 1969.

James, W. *The principles of psychology.* New York: Holt, Rinehart & Winston, 1890.

Kitson, H. D. *The psychology of vocational adjustment.* Philadelphia: Lippincott, 1925.

Kuder, G. F. *General Manual, Kuder Occupational Interest Survey, Form DD.* Chicago: Science Research Associates, 1968.

Parsons, F. *Choosing a vocation.* Boston: Houghton Mifflin, 1909.

Prediger, D. J. The role of assessment in career guidance. In E. L. Herr (Ed.), *Vocational guidance and human development.* Boston: Houghton Mifflin, 1974, in press.

Prediger, D. J., & Roth, J. D. *The data/ideas, people/things dimensions of work and interests: Summary of research and applications.* (ACT Research Report No. 67) Iowa City: American College Testing Program, 1974, in press.

Prediger, D. J., Roth, J. D., & Noeth, R. J. *A nationwide study of student career development: Summary of results.* (ACT Research Report No. 61) Iowa City: American College Testing Program, 1973.

Redmond, R. E. Increasing vocational information seeking behaviors of high school students. Doctoral dissertation, University of Maryland, 1972.

Strong, E. K., Jr. *The vocational interests of men and women.* Stanford, Calif.: Stanford University Press, 1943.

Strong, E. K., Jr. *Vocational interests 18 years after college.* Minneapolis: University of Minnesota Press, 1955.

Strong, E. K., Jr. Satisfactions and interest. *American Psychologist*, 1958, 13 (8), 449-456.

Strong, E. K., Jr. An eighteen-year longitudinal report on interests. In W. L. Layton (Ed.), *The Strong Vocational Interest Blank: Research and uses.* Minneapolis: University of Minnesota Press, 1960. Pp. 3-17.

Super, D. E. *Appraising vocational fitness.* New York: Harper & Row, 1949.

Zener, T. B., & Schnuelle, L. *An evaluation of the Self-Directed Search.* (Report No. 124) Baltimore: Center for Social Organization of Schools, Johns Hopkins University, 1972.

The Use and Evaluation of Interest Inventories and Simulations

/2

John L. Holland

CENTER FOR SOCIAL ORGANIZATION OF SCHOOLS
THE JOHNS HOPKINS UNIVERSITY

ACKNOWLEDGMENTS

I am indebted to the following people for their counsel and editorial assistance. Because I did not always use their advice, I am solely responsible for the content of this paper. My readers included J. Page Clark, Joyce Epstein, Gary Gottfredson, Ellen Greenberger, Elsie P. Holland, John H. Hollifield, Samuel Livingston, Dean H. Nafziger, and James M. Richards, Jr.

J.L.H.

ABSTRACT

This report outlines the practical and scientific issues involved in evaluating the effects of interest inventories on users. The evidence for their actual effects on users is also reviewed. The author concludes:

1. There is no evidence of sex bias in interest inventories if it is assumed an unbiased criterion must be used to make such determinations. So far, charges of sex bias in interest inventories rest on imagined effects and words assumed to be offensive to women.

2. Inventories should be evaluated for their "sex fairness"—do they have effects or outcomes for both sexes that are about equal in number and magnitude, although such effects may differ in kind?

3. We lack consensual definitions of both sex bias and sex fairness, although we may be able to get some consensus about sex fairness.

4. Legal action is unwarranted unless some clear and compelling evidence can be presented for general sex bias in interest inventories. No such evidence now exists.

5. The distributions of vocational aspiration among men and women differ because men and women have different life histories, *not* because interest inventories possess sex-biased characteristics. Changing women's lives will change their scores.

6. Inventories are being made more useful by a continuation of many current trends and activities—creating more options, improving auxiliary materials, performing more studies of the real rather than imagined effects, and so on.

INTRODUCTION

This paper is another contribution to current discussions, workshops, commission reports, journal articles, and governmental activities concerned with sex biases in interest inventories (AMEG, 1973; Campbell, 1973; Harmon, 1973; Huth, 1973; and others). These earlier evaluations are limited because they have centered on the virtues and weaknesses of specific inventories and because they lack good definitions of sex bias, focus on a single aspect of sex bias, or lack documentation for their hypotheses.

This paper is a third attempt (Holland, 1973b, 1974) to clarify some of the issues involved in the evaluation of interest inventories and simulations, and to outline some helpful activities for stimulating the development of more useful inventories. The key assumption in this discussion is that a general perspective—how to build better inventories—will be more helpful for everyone (consumers, practitioners, developers, and publishers) than a continuation of instrument-specific evaluations relying on opinion rather than evidence and focusing only on possible sex, age, racial, or social class biases. At the same time, both general and specific perspectives for coping with the issue of sex bias require better definitions and resolutions of the following questions:

1. What is sex bias? The National Institute of Education (NIE) definition contains so many undefined terms that almost anyone or any influence may be charged with sex bias.
2. What procedures or tests will provide an unbiased assessment of the sex, age, and social class bias of an interest inventory? Without a generally accepted criterion for the assessment of sex bias, we cannot determine with any objectivity the presence or absence of sex bias. If we could not agree that the average yardstick is a reasonable approximation of one yard, we could not agree about the length of large objects. Unfortunately, determinations of bias involve more complex measurement problems.
3. What does "sex-fair" mean? What is a sex-fair interest inventory?
4. Are interest inventories and simulations worth the costs? All treatment procedures—psychological, medical, and sociological—have social costs as well as benefits. The current discussions about the value of interest inventories raise questions of cost. For example, should interest inventories be abandoned because some small portion of the population believes they are harmful to some women? Under what conditions would the costs (if they are documented) be high enough to justify making such recommendations? On balance, do the benefits clearly outweigh any costs?
5. Are any inventory revisions justified by the available evidence?
6. What are the most practical and promising avenues for improving the quality of interest inventories? Should we sacrifice validity for social action?
7. Should the NIE or the Office of Education (OE) have any regulatory function in the area of vocational guidance? The proposed guidelines for interest inventories will tend to have the force of legislation even if offered only as guidelines. Should the NIE or OE rely more on the ingenuity and good will of authors and publishers for desirable change? Has a Federal agency ever created a good inventory or any other valuable guidance product? Will guidelines raise the cost of inventory development and stifle further innovation in interest measurement?

The remainder of this paper is an attempt to clarify these ambiguous questions by putting them in the perspective of how to create better inventories. For convenience, I have organized my thinking about interest inventories and sex bias into four sections: (1) using interest inventories, (2) evaluation, (3) scientific issues and problems, and (4) recommendations and strategies.

USING INTEREST INVENTORIES

This section summarizes some common uses of interest inventories, defines some minimal goals for such applications, outlines the properties of an ideal inventory, defines a biased or poor inventory, and discusses the complex forces that lead to a person's interest inventory scores. For this purpose I have drawn on my own experience

and the following sources: Campbell, 1974a; Cole, 1973; Craven, 1961; Crites, 1969; Harmon, 1973; Kuder, 1971; Super and Crites, 1962.

In general, interest inventories are used to provide information for making better educational and vocational decisions. More specifically, they are used—

(1) to reassure people about tentative choices;
(2) to give people a structure for understanding the world of work;
(3) to help people resolve conflicting alternatives;
(4) to help people plan their personal development;
(5) to call attention to desirable alternatives that the average person usually does not know about or overlooks;
(6) to help people understand their job dissatisfaction;
(7) to help employers select people who will be better workers;
(8) to help people plan their career advancement;
(9) to aid in the scientific study of the world of work and to link this research to other research in the social sciences.

These common uses range well beyond what individuals seeking vocational assistance expect an inventory to do. A minimum list of expectations is difficult to define. In general, the more purposes an inventory can satisfy, the more useful it is assumed to be. There is no clear way to decide what its minimum functions should be. Despite this reservation, I would argue that, at a minimum, interest inventories should help people seeking vocational assistance in the following ways:

1. It should reassure people about their tentative choices and suggest vocational options that are equally or more appropriate both in kind and in level. Depending on the person, some people will need more alternatives of a given kind, some will need more higher or lower level alternatives, and some will need alternatives of a different kind and at a different level. Here *kind* refers to the content of a job—sales, clerical, artistic—and *level* refers to the level of talent and training required to do a job.
2. It should show people all the common vocational alternatives or, through auxiliary materials, show them the full range of alternatives. At any rate, through some combination of scales, profiles, or auxiliary materials, it should provide people with the complete range of occupational possibilities where, given the necessary training and job opportunity, they would find happiness and satisfaction.
3. It should rely on a comprehensive and valid assessment of people's interests rather than on age, race, sex, or social status taken out of the context of vocational potential. In addition, such assessments should either include or be used in conjunction with estimates of aptitudes and competencies.

These minimum essentials are assumed to be the foundation for most common and desirable uses. For example, attempts to teach people the structure of the world of work are facilitated when an inventory or its associated system of occupational classification is extensive rather than abbreviated; likewise, the more alternatives an inventory presents, the easier it becomes to locate possible routes of vocational achievement (alias "career ladders") or to find different kinds of work (alias "break the vicious circle").

IDEAL INVENTORIES

Before we attempt to estimate how well some popular inventories provide the minimum essentials of useful information or service, it appears helpful first to outline what characteristics an interest inventory must possess to meet not only the minimum essentials but also the full range of desirable expectations.

If an inventory is to provide useful information and to have beneficial effects, it should ideally have many positive characteristics. It should—

1. Provide occupational forecasts of satisfaction and achievement. Although any information about a person or a vocation may be helpful, information with high predictive validity is especially helpful.

2. Provide the full range of vocational options by both type and level. All inventories fail to suggest all possible vocational options even for the most favored persons in our culture (tall, white, college-educated Protestant males without physical or psychological difficulties).
3. Provide information or influences that are stable or reliable from one time to the next.
4. Provide an experience that is effective. Interest inventories should stimulate vocational exploration, reassure people about wise choices, upset people about unwise choices, provide long-range perspectives, provide new information (new to the person) such as more vocational alternatives, support people resisting destructive cultural forces, and promote self-reliance and understanding.
5. Provide information that is in accord with a person's life history, current circumstances, and personal potential rather than factors such as age, race, sex, and social status.
6. Be based on a useful theory of vocational behavior, including a classification system to organize all possible alternatives. Theoretically based as opposed to empirical inventories provide a more explicit rationale that is more amenable to public examination and revision.
7. Include auxiliary materials to increase positive influence and avoid negative side effects. For example, brochures that summarize information about an inventory's strengths and weaknesses should be included with every test booklet.
8. Be oriented toward the most common occupations and to some degree toward the spectrum of the future world of work.
9. Be adaptable to new educational and occupational information. To some extent, the easier an inventory is to revise, the more likely it is that revisions will occur.
10. Be relatively resistant to client or counselor abuse and distortion. The more complete and explicit an inventory is and the more independent of the vagaries of counselors and clients, the less likely it is that its positive effects can be twisted by human hands and minds. Likewise, an inventory that lends itself to simplicity of interpretation and scoring should be less vulnerable to abuse than one that does not.

To gain some perspective about the assets and liabilities of interest inventories, the ideal characteristics have been applied to several interest inventories as well as some other common sources of occupational information. Table 1 compares interest inventories with other sources: computerized guidance systems, counselors, and parents. Although it contains only my

TABLE 1.—*Application of some ideal criteria for assessing the quality of vocational interest inventories and other sources of occupational information*

Ideal characteristic	Interest inventories	Computer guidance systems	Counselors	Parents
Validity	1	2	3	4
Range of options	3	1	2	4
Reliability	1.5	1.5	3	4
Effectiveness	1.5	1.5	3	4
Freedom from bias	1.5	1.5	3	4
Theoretical base	1	2	3	4
Auxiliary materials	2.5	2.5	1	4
Common and future occupations	3	1	2	4
Adaptability	4	3	1	2
Resistance to abuse	2	1	3	4
Efficiency	1	2	3	4
Other	1	2	3	4

NOTE.—If readers substitute their favorite inventory, parent, counselor, or guidance system in this table, they will obtain a different but similar picture. (1 = high; 4 = low)

subjective ratings, it is likely that there is some consensus (untested) about some of them. For example, Hewer's data (1966) strongly imply that counselor judgment about the realism of vocational choices is poor, and other data indicate that interest inventories have a marked reliability and considerable predictive validity for some purposes (Campbell, 1971).

Table 2 illustrates how some of the criteria might be applied to some typical inventories. These comparisons suggest that no inventory fulfills all criteria. Different people would weight the criteria differentially; the ratings were performed by a person with multiple conflicts of interest. This subjective evaluation is clarified somewhat in the following section on evaluation.

TABLE 2.—*Application of ideal criteria to some interest inventories*

Ideal characteristic	Kuder OIS	SCII	SDS
Validity	3?	1?	2?
Range of options	2?	3?	1?
Reliability	—	—	—
Effectiveness	—	—	—
Freedom from bias	—	—	—
Theoretical base	—	—	—
Auxiliary materials	1?	2?	3?
Common and future occupations	—	—	—
Adaptability	—	—	—
Resistance to abuse	—	—	—
Efficiency	—	—	—
Other	—	—	—

NOTE.—If readers will attempt to rate these three inventories from 1 (high) to 3 (low) on each ideal characteristic, the ambiguities and the need to weight some characteristics more than others will become immediately apparent.

BIASED AND POOR INVENTORIES

Seen in the context of an ideal vocational interest inventory, a poor inventory is characterized by multiple faults. A poor inventory provides unreliable and invalid information, has little positive influence, is based on an incomplete assessment of interests, and provides only a narrow range of suggested options.

A biased inventory (sex, race, social status) can be viewed as a special case of a poor inventory. Just as poor counselors sometimes rely on a favorite inventory, an inflexible interview procedure, or a single aptitude test battery, so biased inventories depend primarily on a person's sex, age, social status, or an incomplete interest assessment.

This rationale leads to the following general definition of both poor and systematically biased vocational interest inventories: *Those inventories that depend primarily on the sex, age, social status, or other characteristic of the recipient rather than on a comprehensive and valid assessment of a person's interests are sex biased.*

Systematic bias, or the systematic disadvantagement of some special group, must be distinguished from the existing positive correlations between some human potentials and some kinds of job requirements. For example, in our culture, parental, peer, and institutional influences lead to a strong preference for social- and artistic-oriented occupational preferences among women and to mechanical-technical preferences among men. Assessment devices must score or note the effects of a lifetime—to fail to do so would lead to invalid assessment. The detection of sex bias requires a method for differentiating such existing correlations, which imply a fitness for sex-dominated occupations, from invalid or limited assessments that automatically restrict a person's freedom of choice, either deliberately or through error. These existing correlations have been labeled by some as the "vicious circle"—"discrimination leads to sex-related potential, and discrimination keeps us there." This situation holds for everyone—no one escapes his or her life history. For example, upper and lower class people are prepared more for some jobs than for others; unemployed Ph. D.'s find it difficult to secure employment in two-year colleges and high schools; furloughed airline pilots find nonairline and lower paying jobs difficult to secure; and students having good grades fare better than those with poor grades.

With the exception of extreme cases, the application of our definition of poor and systematically biased inventories to practical problems will require considerable judgment. For example,

if each of a heterogeneous group of 100 high school girls, after taking an interest inventory, says, "I should become an elementary school teacher," the reported scores may be based on sex only. Most evaluations of the effects of inventories appear to require judgments about the characteristics of the people using different vocational services *and* the degree to which the suspected bias or outcome is simply a natural but limited correlate of vocational potential. For example, we don't encourage shy persons to become salespeople, clumsy people to become acrobats, ugly people to become fashion models, or inarticulate people to become writers. Because they assess the effects of socialization, interest inventories will encourage women to enter socially oriented occupations more frequently than men. Likewise, large proportions of men will be encouraged to enter skilled trades and technical occupations. In short, interest inventories would do people a disservice if they encouraged people to enter occupations that were grossly inconsistent with their socialization experience.

A determination of bias or a poor interest assessment appears to require several tests: (1) Do experts agree after performing ideal vocational assessments that each man or woman was given competent service? (2) To what extent does the distribution of reinforced vocational options produced by a vocational intervention depend on the input and to what extent on the intervention? (3) Does the suspected bias (sex, age, physical disability) represent a rational and desirable capitalization on a particular characteristic rather than operation of a destructive bias? For example, counselors seek to capitalize on a person's special talents and remaining physical capabilities in helping people cope with physical trauma. Consequently, patient outcomes will usually be related to their strengths, which may in turn be sex-related characteristics—those characteristics that our culture encourages in each sex.

Positive correlations between the sex of the respondent and interest patterning are ambiguous data. For example, if a young man has substantial science interests and weak remaining interests according to one of the Kuder inventories, the results may be interpreted in at least two different ways: (1) The results may mean that playing a traditional masculine role is of marked importance or (2) they may represent some defect of the inventory. But looking at the Kuder or consulting the man are not substitutes for a case study of the person, his life circumstances, and the intervention.

BIASES, PERSONAL HISTORY, AND HEREDITY

At the time of any vocational assessment of fitness for an occupation, everyone's responses [illegible] scores depend on past experience as well as [illegible]ate potential. In any case, everyone has to l[illegible] for a while with his or her current level of proficiency.

Assessment devices work as well as they do because they score a person for those special life histories that lead to fitness for some groups of occupations as opposed to others. The evidence that documents the effect of differential experience and expectations for men and women in the American culture is vivid, voluminous, and increasing. Table 3 illustrates the divergence in the occupational aspirations of boys and girls that has already begun by the 5th grade and is maintained through the 12th grade. For example, 5th grade girls aspire to Social occupations most (teaching, social work, etc.) and Realistic occupations least (skilled trades, labor, machine operator, etc.). More recent studies report the same trends for second graders (Siegel, 1973) as well as 3-, 4-, and 5-year-old boys and girls (Kirchner & Vondracek, 1973).

Most recently, Prediger, Roth, and Noeth (1973) report the distributions of occupational preferences of 8th and 12th graders (N = 32,000) in 200 schools selected in a national multistage probability sample. Because their six main categories closely parallel Holland's classification—Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C)—their data replicate the data in table 3. Boys prefer R, I, and S occupations, whereas girls prefer S, C, and I occupations. (See table 7, p. 13, Prediger, Roth, and Noeth, 1973. Note, too, that their table 7 shows only minor differences between the 8th and 12th grades for each sex.)

TABLE 3.—*Distributions of vocational aspirations (free responses) of urban students in the 5th—12th grades (N = 889)*

Grade	Sex	Student aspirations (%)					
		R	I	A	S	E	C
5th	B	36	28	10	19	3	4
	G	3	12	15	57	8	5
6th	B	44	33	4	16	4	0
	G	0	15	18	49	14	3
7th	B	38	16	9	24	14	0
	G	3	8	18	50	8	14
8th	B	38	21	15	18	8	0
	G	1	13	11	43	13	20
9th	B	23	23	15	31	8	0
	G	0	13	13	67	0	7
10th	B	20	26	14	23	4	13
	G						
11th	B	14	51	8	11	14	3
	G	0	44	11	41	2	3
12th	B	45	9	9	27	9	0
	G	2	22	9	35	5	28

NOTE.—These are accidental samples obtained in a large city school system by some undergraduate students (Weingarten & Sirkis, 1973) using a free response form. Students were asked to "list below the occupations you have considered in thinking about your future. . . . Put your most recent job choice first . . . ." Student responses were coded according to the Holland classification scheme. The distributions of choices were converted to percentages so that the trends across the rows would be easy to see. Note that boys favored R, I, and S jobs, whereas girls favored S, A, and C jobs.

EVALUATION

The purpose of this section is to review what we know about the effects of interest inventories on the user. This information has been organized as assumed effects, documented effects, relative effects, and needed evidence.

ASSUMED EFFECTS

In general, professionals have assumed that interest inventories have the desirable effects listed earlier. Most vocational counselors would probably say that interest inventories are their standard and most helpful tool in dealing with people seeking help or advice. Counselors have also recognized that interest inventories are sometimes less useful in dealing with women, members of minority groups, and poor people. These beliefs have led to several practices that are assumed to be helpful: having people take several inventories, take male and female forms of the same inventory, forgo inventories for case history evaluations, or use simulated work stations.

Some assumed effects do not require new investigations to document their validity or invalidity for selected purposes. For example, there is sufficient positive evidence to support the use of interest inventories in selection (Crites, 1969). Likewise, Holland has demonstrated that his Vocational Preference Inventory (VPI) and his simulation, the Self-Directed Search (SDS), are useful devices for investigating and organizing both personal and environmental information (Holland, 1973a). Likewise, the following assumption in the NIE scope of work for this paper is contradicted by overwhelming evidence in *all* studies of the predictive validity of *all* interest inventories: "Given differences in expressed interests of men and women, how can inventory results do other than reinforce sex-role stereotypes?"

The fallacy in the NIE hypothesis is that it confuses an ideal with the reality of personal development. As a result of growing up in the American culture, the sexes develop somewhat different interests, abilities, and personal dispositions, so that they are prepared for somewhat different kinds of work. Consequently, any reinforcement of these vocational predispositions by the taking of an interest inventory must be minute (about one hour) when compared with a lifetime of reinforcement (15 to 20 years). In addition, if the NIE statement means that the results of taking an interest inventory must reinforce, always and only, a person's current aspiration, then it would be valid only if inventory results corresponded precisely with personal aspiration. For example, every man who expresses an interest in becoming a secretary would always have to find that the inventory reports "Go do it" (secretary scale, clerical scale, SDS code for secretary). For this situation to occur, an inventory must have 100-percent agreement between expressed choices and scale scores. The fact is that the Kuder, Strong, Self-Directed Search, and similar devices range only from about 35- to 68-percent agreement

between categorized or specifically expressed vocational aspirations and inventory scale scores, profiles, codes, or discriminant function procedures.

Table 4 illustrates how a typical interest device presents men and women with more options rather than only a person's expressed vocational aspiration. This table, taken from the SDS *Professional Manual* (Holland, 1972), indicates that fewer than 10 percent of the people who take the SDS receive specific support for their first choice. (Even for this 10 percent sample of people, other closely related choices are indicated in addition to their first choice.) And about 90 percent of the SDS takers are "advised" to consider "closely related" occupations (closely related to their current vocational choice) or "remotely related choices" (different major categories). This evidence indicates in an explicit way how an interest device lays out a variety of options for most people (90 percent) rather than simply mirroring their current occupational choices. Similar tables exist for other inventories (Campbell, 1971, tables 2-7, 2-8, pp. 45-47; Kuder, 1971, table 5, pp. 30-31).

These data are sufficient to refute the main reinforcement argument. Advocates of the reinforcement assumption might still argue: But what about that small proportion (10 percent) of women who received reinforcing scores? To clarify this question and the assumed bias, we need to know by some independent assessment how many prospective jobholders are in fact "good" as opposed to "poor" prospects. (The proposed definition of sex bias in this paper is applicable here.) Finally, an inventory should reinforce some useful proportion of a population's expressed choices or we are led to an absurd conclusion: A good interest inventory never supports your vocational intentions; therefore the best inventory is the most invalid inventory possible. Whatever you want to do, the inventory says "No!"

DOCUMENTED EFFECTS

In contrast to speculation and opinion about the effects of interest inventories, the evidence about the actual effects of interest inventories is sparse. This situation exists because psychologists have usually been concerned with psychometric problems rather than treatment effects. Consequently, nearly all empirical studies are concerned with reliability, validity, item format, norms, profiles, and related matters. In addition, other studies usually confound the counselor effect with the effect of interest inventories and other tests, so that the specific effect

TABLE 4.—*Agreement between a person's SDS summary code and code of current occupational aspiration for samples of high school and college students*

	Degree of agreement	Boys (N = 218) % agree	Girls (N = 148) % agree	Men (N = 355) % agree	Women (N = 362) % agree
		(cumulative percentages)			
6	Letters and order exactly same (e.g., RIC, RIC)	9.0	9.0	11.8	14.1
5	1st and 2d letters of SDS code match 1st and 2d letters of other code (e.g., RIC, RIE)	23.0	14.0	21.7	25.1
4	Letters of SDS code match letters of other code in any order (e.g., RIC, ICR)	35.0	28.0	27.0	39.5
3	1st letter of SDS code matches 1st letter of other code (e.g., RIC, REA)	58.0	51.0	45.6	65.7
2	1st and 2d letters of SDS code match any two letters of other code (e.g., RIC, IER)	68.0	71.0	61.4	74.3
1	1st letter of SDS code matches any letter of other code (e.g., RIC, CRE)	83.0	88.0	83.7	97.8
0	1st letter of SDS code is not included in other (e.g., RIC, CES)	100.0	100.0	100.0	100.0

of interest inventories cannot be ascertained (Campbell, 1965).

Effects of the SDS. The Self-Directed Search (Holland, 1972), a simulated vocational counseling device, provides the best evidence to demonstrate the probable effects of an interest inventory. So far, two experimental studies in the United States (Redmond, 1972; Zener & Schnuelle, 1972), one in Australia (Long, 1972), and one in Nigeria (Gesinde, 1973) reveal that the SDS has desirable effects on both boys and girls and men and women. No study found any statistically significant differences between the sexes. Zener and Schnuelle found that the number of occupations that high school girls were considering had significantly increased three weeks after they had taken the SDS. This positive influence held also for boys, and at all social class levels and in all four high schools studied.

Redmond also found that the SDS increased the vocational options of both girls and boys. Like the Zener and Schnuelle study, the Redmond experiment used a sophisticated design that is hard to fault. Redmond's experiment also indicated that the SDS was successful in stimulating both girls and boys to seek more vocational information. The Zener and Schnuelle experiment failed to get this effect.

A reanalysis of a portion of the Zener and Schnuelle data provides an especially graphic and persuasive account of the effects of the SDS on the choices of girls and boys. These new analyses are contained in tables 5 and 6. Table 5, for girls, was created to test the hypothesis that the SDS *broadens* the number of major occupational groups that girls consider three weeks after the treatment. A second group of girls took the Vocational Preference Inventory instead of the SDS, and a third group received no special treatment.

Table 5 shows that girls tend to shift more frequently to other occupational categories after taking the SDS than girls receiving no vocational treatment. The boldface numbers in the diagonals represent the number of girls who did not shift from one category to another after taking the SDS. The numbers outside the diagonals represent shifts (for example, three girls shifted from Social to Artistic after taking the SDS). The figures in the right-hand column indicate the total percentage of girls who fail to make a major shift in occupational plans (for example, their first and second vocational choices are identical or belong to the same major occupational category on both occasions). Although the percentage differences are not statistically significant ($p < .10$) for the SDS versus the control girls, table 5 provides *no evidence* that the SDS discourages women from considering a broader range of alternatives.

Table 6, for boys, shows that the SDS helps boys focus their vocational objectives. In contrast to girls' choices, the first vocational choices of boys are distributed more widely; thus, after the SDS experience, boys tend to remain more frequently in the same major occupational category. In this regard it is important to recall that both boys and girls are considering *more* options after the SDS than before. Other empirical data also indicate that the SDS tends to expand the breadth or variety of occupations a person considers.

Taken together, the four experimental studies and the present evidence about the degree of agreement between one's occupational aspirations and SDS codes (table 4) strongly suggest that the influence of the SDS is consistent with the objectives of ideal vocational guidance practice—both boys and girls are encouraged or instructed to explore more alternatives rather than to content themselves with a single objective. Put another way, the SDS is especially useful for helping most people extend their vocational horizons.

Evidence to support or refute the more specific hypothesis that "the SDS discourages women from entering the skilled trades . . . and men from entering office occupations [U.S. HEW, Office of Education, 1972]" is hard to come by. The data in table 5 indicate only three girls who aspired initially to Realistic jobs (some engineering, skilled trades, laboring jobs). Helms and Williams (1973) found only six high school girls with skilled trades interest after assessing 1,550 10th and 11th grade girls in three high schools. To make matters worse, the candidates who are bona fide among the six aspirants must

TABLE 5.—*Effect of the SDS, VPI, and control experiences on the vocational choices of high school girls*

2nd VC (SDS experience)

1st VC	R	I	A	S	E	C	Total	Same category
R								
I	6					2	8	6
A	1		4	1			6	4
S	1		3	13		4	21	13
E	1				5		6	5
C			2	4		12	18	12
Total	9		9	18	5	18	59	40 (67.80%)

2nd VC (VPI experience)

1st VC	R	I	A	S	E	C	Total	Same category
R	1	1					2	1
I		10		3			13	10
A			5		2		7	5
S		3	1	19	1	1	25	19
E					2		2	2
C		1	1	4		11	17	11
Total	1	15	7	26	5	12	66	48 (72.73%)

2nd VC (controls)

1st VC	R	I	A	S	E	C	Total	Same category
R	1						1	1
I		4	1	1		1	7	4
A			2	2			4	2
S		2		24	1	5	32	24
E				1	3	1	5	3
C		1		1		14	16	14
Total	1	7	3	29	4	21	65	48 (73.85%)

be separated from those who are not, before we can conclude anything about sexism. For example, four aspirants might be outstanding candidates for Realistic jobs and two might belong elsewhere. Other data (Nafziger, Holland, Helms, & McPartland, 1972) indicate that two-thirds of the young women in Realistic jobs, interviewed in a large national representative sample, aspire to leave Realistic jobs and want to reenter Social and Clerical jobs. Such evidence implies that many women do not belong in technical and laboring jobs because current socialization makes them unfit, because they dislike such jobs, or because men drive them out. In any case, a woman whose interest and ability patterns indicate suitability for the skilled

TABLE 6.—*Effect of the SDS, VPI, and control experiences on the vocational choices of high school boys*

2nd VC (SDS experience)

1st VC	R	I	A	S	E	C	Total	Same category
R	7	2					9	7
I		23			1		24	23
A			4				4	4
S			1	1		1	3	1
E			1				1	0
C						3	3	3
Total	7	25	6	1	1	4	44	38 (86.36%)

2nd VC (VPI experience)

1st VC	R	I	A	S	E	C	Total	Same category
R	13	2				1	16	13
I	3	7	1	1			12	7
A			4	2	1		7	4
S				9			9	9
E				1	4		5	4
C	1			1		5	7	5
Total	17	9	5	14	5	6	56	42 (75.00%)

2nd VC (controls)

1st VC	R	I	A	S	E	C	Total	Same category
R	13	2		1			16	13
I	3	18		1	1		23	18
A			2	2			4	2
S		2	1	4			7	4
E	1			2	4	1	8	4
C		1				4	5	4
Total	17	23	3	10	5	5	63	45 (71.43%)

trades is not discouraged from entering a trade. The SDS treats all persons as individuals and not as representatives of a group—"women" or "men."

Effects of other inventories. We were unable to locate explicit evidence about the effects of the SVIB or Kuder that was not confounded with other influences (counselors, test batteries, and so on). However, there is no compelling reason why these inventories should not have effects upon people resembling those obtained for the SDS.

RELATIVE EFFECTS

It appears useful to see the influence of interest inventories in the context of other influences assumed to affect a person's vocational aspirations. At the same time, it should be borne in

mind that even under the best conditions interest devices rarely have effects of great magnitude. Both the Zener and Schnuelle (1972) and Redmond (1972) studies report only small effects on the aspirations and vocational planning of students. The majority of students, although they may be directed to explore some alternatives, continue to aspire to the same occupations.

Other studies reveal that a person's vocational choices are influenced more by almost everything else than by an interest inventory. Surveys of high school and college students present a consistent picture: friends, family, schoolwork, and work experience are the most potent influences, whereas counselors and tests are usually at the bottom of these listings. Tiedeman, O'Hara, and Mathews (1958) have reviewed these and other data and have reported that social class is the major correlate of vocational preferences.

The self-report evidence appears consistent with the relation of vocational choice to socialization experience, reviewed earlier, and with the experience of vocational counselors. The main role of interest inventories appears to be either to confirm a desired alternative or to provide similar alternatives (closely related to the current aspiration) that a person has often been unaware of. This is not to deny that counselors help resolve conflicts about choices, lead people to explore training possibilities, or help locate remote alternatives.

At the same time, it is relatively rare for counselors, using a complete kit of psychological tools, to talk people out of their current goal and to direct them (subtly or otherwise) to some remote alternative. Such great shifts, however, are frequent outcomes of direct work or training experience. This clinical experience is valuable because it implies that most people do not respond uncritically to every bit of information that they encounter.

NEEDED EVIDENCE

There is strong experimental evidence, as reviewed in the preceding section, that at least one interest device has several desirable outcomes for both men and women. They include reassurance, more options, and learning something of the world of work. It seems reasonable to assume that other interest inventories (whose *effects* may have gone untested) have similar effects, although this has not yet been documented.

The Zener and Schnuelle (1972) and Redmond (1972) studies demonstrate that the SDS is evaluated by boys and girls in the same way; its effects hold equally for both sexes. Similar studies of other inventories are needed.

Another vital study is suggested by our definition of sex bias. In short, we need to examine the effects of interest inventories by using an *unbiased* criterion or at least a *sex-fair* criterion. Such studies might proceed as follows: (1) Obtain large samples of men and women or boys and girls. (2) Assess their vocational potentials via standard life histories and assessment devices, except for interest inventories, and arrive at some judgments about vocational potentials. (3) Categorize these judgments in the same terms as the interest inventory to be evaluated. (The assessors should of course be equally divided according to sex and certified for their relative degrees of sexism by using the Spence and Helmreich scale, 1972.) (4) Administer the interest inventory to be evaluated. (5) Compare clinical and interest inventory assessments. (6) Ask assessors and a panel of adults to evaluate the results.

Such studies would be difficult but invaluable in learning whether or not inventories have the biases attributed to them by a few critics. At this time there is *no scientific evidence* that interest inventories have any of the negative effects attributed to them by commissions (AMEG, 1973; U.S. HEW, Office of Education, 1972). Instead, such groups have *assumed* that inventories must have certain effects because they are constructed in special ways or have items that *look* as if they must create certain effects.

Interest inventory manuals could be reviewed to develop a list of an inventory's uses. These advocated uses could also serve to specify criteria for assessing effects: reassurance, more options including level and type or kind, understanding the world of work. This activity is important because different inventories have both similar and dissimilar influences.

If multiple evaluative studies and projects over a wide range of populations reveal that interest inventories do as much for men as for women, it would be reasonable to assume that interest inventories are sex-fair. *"Sex-fair" means an equal number of effects of about equal size, but these effects may include both similar and dissimilar influences.* Because we have no agreed-on definition of sex bias, evaluation of sex bias is much more difficult. The definition advocated by NIE ("Within the context of career guidance . . . any factor that might influence a person to limit—or might cause others to limit—his or her consideration of a career solely on the basis of gender") is of no use for the following reasons: (1) No interest inventories base results solely on gender, but rather all are based on a pattern of interest. (2) The definition provides no procedure for discriminating between the effects of growing up in the United States and some irrelevant limitation unrelated to one's vocational potential. (3) If literally applied, it would prohibit parents from speaking to their children, husbands to wives, wives to husbands, or lovers to lovers.

SCIENTIFIC ISSUES AND PROBLEMS

In this section some of the problems and issues in the development and revision of interest inventories are reviewed. For this discussion it is assumed that the goal is to develop or revise inventories so that they are capable of producing a maximum number of desirable effects—especially those effects characterized as essential. In this context, sex bias by our definition is only one of several undesirable outcomes to be avoided; other biases include age and social status.

It also appears useful to evaluate interest inventories more by their effects than by any other criterion. Good solutions can flow from a variety of methods and materials. In addition, attempts to define a good inventory according to the best method of construction will lead to a freezing of innovation and a failure to focus on the most important immediate and practical concern—when a person takes an interest inventory, what are the outcomes of that experience? How an inventory was constructed is not as important as how well it helps people.

When we focus on outcomes rather than methods, it is easier to see that tinkering with existing inventories or advocating a special method of scale construction will limit the pool of helpful ideas and probably produce only minor effects. Efforts to create effective inventories can profit from an examination of psychometric as well as substantive, theoretical, political, educational, and legal issues. Earlier reports (AMEG, 1973; U.S. HEW, Office of Education, 1972) present a constricted, oversimplified, and occasionally uninformed perspective which we should resist.

PSYCHOMETRIC AND STATISTICAL ISSUES

Nearly all of the ideas proposed to eliminate alleged sex bias are controversial or involve important value judgments, and none of these proposals has been tested to learn if it actually creates the desired effect.

Are homogeneous scales to be preferred to empirical keying by using defined criterion groups? Clark (1961) reported that empirically defined scales, as opposed to homogeneous scales, have more validity for differentiating between occupational samples. In addition, people sometimes find their resemblance to a specific occupational member very helpful. On the other hand, a relatively small set of general interest scales (homogeneous scales) are relatively inexpensive to create and can be used to characterize most occupations. Nunnally (1967) offers a number of psychometric arguments for the use of homogeneous scales. In short, the choice of a scaling procedure involves questions of validity, funds, client effects, many vocational options (homogeneous scales) versus specific occupational information (occupational scales), and classificatory problems. Consequently, there is no clear winner. The new Strong-Campbell Interest Inventory (SCII) will have both kinds of scales.

Should single norms or separate norms for men and women be used? A single set of norms used with either sex has not been tried; one can only

speculate about such norms. Separate norms for men and women are a mixed bag. They reduce a major factor (sexual socialization), but they can be misleading to the user. For example, a woman with high skilled trades interests on female norms may have a very low raw score relative to the level needed to enjoy that kind of work. Similarly, a man with a 60th percentile on an artistic scale may have a very low raw score and little interest compared with people in artistic occupations. In short, separate norms provide "fair" comparisons, but their relation to occupational reality is sometimes misleading. In addition, experience with sex norms for the same occupation indicates that some small proportion of men and women will be distressed because they get higher scores on the opposite-sex norms than on the same-sex norms.

Recently Gottfredson and Holland (1974) normed the summary scales of the SDS to examine the effects of norming raw scores. The effects were twofold: (1) the distribution of codes for women became more rectangular (more women obtained R, I, and E codes), but (2) the predictive validity of the SDS for the total sample of women dropped by half. In short, the use of female norms encouraged some women to consider a greater variety of careers but such encouragement was achieved at the expense of predictive validity. Tables 7 and 8 show the data. The effect of norming the SDS scales for men was negligible. Compare tables 7 and 8.

TABLE 7.—*Validity of highest normed summary score for predicting women's occupational choice 1 and 3 years later*

		Occupational choices 1 year later of women in a State liberal arts college						
		R	I	A	S	E	C	Total
Highest normed score	R	1	7	6	34	1	2	51
	I	21		1	51	1	2	76
	A	11	24		54	1	2	92
	S	5	5	74				84
	E	2	7	46	1			56
	C	8	1	54	7	3		73
Total		1	54	44	313	11	9	432

28.7% hits; kappa = .12; $p < .001$

		Occupational choices 3 years later of women in a State university						
		R	I	A	S	E	C	Total
Highest normed score	R	2	9	9	27	3		50
	I	1	51	4	49	5	2	112
	A	8		30	62	10	1	111
	S	6	8		81	7	1	103
	E	10	18	78		9	1	116
	C	1	4	47	3		10	65
Total		3	85	73	344	37	15	557

32.8% hits; kappa = .17; $p < .001$

TABLE 8.—*Validity of SDS summary code for predicting women's expressed occupational choices 1 and 3 years later*

Occupational choices 1 year later of women in a State liberal arts college

First letter of SDS summary code	R	I	A	S	E	C	Total
R	1			3		1	5
I	**22**	1	34	2	2	61
A	10	**30**	33	1	2	76
S	1	21	12	**234**	6	3	277
E			1	3			4
C				6	2	1	9
Total	1	54	44	313	11	9	432

66.4% hits; kappa = .33; $p < .001$

Occupational choices 3 years later of women in a State university

First letter of SDS summary code	R	I	A	S	E	C	Total
R	1			1			2
I	3	**41**	6	34	6	2	92
A		11	**27**	48	10	1	97
S		29	34	**247**	18	5	333
E		3	4	6	**2**	1	16
C		2		8	1	**6**	17
Total	3	85	73	344	37	15	557

58.0% hits; kappa = .28; $p < .001$

Should inventories be normed? The Gottfredson and Holland (1974) study shows that norming sometimes reduces the predictive validity of an inventory. Unnormed inventories have another advantage. For example, the unnormed SDS is an "open" inventory; people can see how their scores were obtained, how the scores are related to the occupational outcomes, and what they need to do to change their scores and their options. In contrast, normed inventories are usually "closed" inventories. People don't know how their scores were obtained; consequently they have less control over their own vocational assessment.

Should we have separate forms for different age groups and sexes? This area is another no-person's-land. Either we don't know, or it depends. Special forms for special groups appear to have two likely disadvantages: (1) They are apt to encourage the individual to examine only a limited number of options, and (2) such options are apt to be biased because of some restricted purpose—jobs for older women returning to work, jobs for the handicapped, jobs for older persons. These effects may occur because special forms for special populations will present only a portion of the world of work. Users will then conclude that this restricted portion is everything

possible rather than only the more likely possibilities.

A not unimportant consideration is that multiple forms are more expensive and in the long run those costs will be passed on to the consumer. Again, these questions would be easier to resolve if we had experimental studies of the actual effects of single versus separate forms.

Is the single form of an inventory the best resolution? Single forms have several important strengths: (1) Everyone is confronted with the same stimuli (questions, ratings, judgments), (2) everyone is scored in identical fashion, and (3) everyone can be shown an identical set of occupational options. However, identical stimuli do not guarantee identical outcomes (I am indebted to David P. Campbell for this insight). If an interest inventory consisted of the two items "Would you like to be (1) a children's clothing designer? (2) a mechanical engineer?" about 90 percent of the women would say yes to 1 and no to 2, and men would have a reversed pattern of responses.

The potential resolutions of this situation are multiple and largely unsatisfactory: (1) Omit all items that men and women or other groups respond to differently. Perhaps 40 percent of the available items would have to be omitted, and that step would vitiate an inventory's validity. (2) Revise the items, using an iterative procedure, until the distributions of outcomes for men and women are the same—an impossibility according to some developers, unlikely in view of our current knowledge of sex differences in interests, and undesirable if we wish to take these individuals' differences into account.

Despite the obvious advantages of a single form for everyone, a case can still be made for the use of special forms: (1) Special forms may meet the special needs of any group more expeditiously. For example, an interest inventory for women could display all the major possibilities but focus on the most likely possibilities. (2) Special forms could be more responsive to the data about women's interests—compromises between male and female data, norms, and generally acceptable items would not be necessary. These advantages would have to be weighed against the virtues of a single form. Again, no general rule may be possible, because different inventories have different potentials for revision and extension.

Should we revise the content of interest inventories to reduce their alleged sex bias? Harmon (1973) has proposed that we "excise the concepts of men and women" so that no charge of sexism could be made.

Again there is no clear evidence that a word like *salesman* has any significantly different effect on the test taker than a word like *salesperson.* Nevertheless, a few or even wholesale revisions of this kind have been made in several inventories (Campbell, 1974b; Holland, 1972).

A closely related and perhaps more important question is whether or not we should remove or revise items that represent experiences normally withheld from women or men in our culture—for example, "I can use a power saw" or "I can use a sewing machine." Again, we need to learn if the effects of deletion or revision would be in the average user's best interests rather than to make revisions only to pacify some political action group. The number of groups who might decide to rewrite interest inventories is potentially large and could conceivably deprive the majority of unconcerned and satisfied users.

A promising strategy would be to review an inventory's content to learn if it is sex-fair—that is, if about half of the items favor each sex. Such a compromise would keep sex in the inventories as well as in the culture. In this regard, we need to learn if there is in fact a pool of useful items (now omitted from inventories) that we could use to balance and revise inventory content. For convenience, this hypothesis has been labeled the "unused item pool" hypothesis.

In making such revisions it is important to avoid creating inventories that lack validity because most of the difficult items have been watered down so that an indiscriminate interest inventory is created. For example, as items become easier they often become meaningless. The following burlesque illustrates the problem.

Regular item: I can make simple plumbing repairs.

Moderate difficulty: I know what a faucet washer looks like.
Easy item: I can find "plumber" in the Yellow Pages.

In general, the revision of the content of different interest inventories and simulations involves different psychometric problems. Consequently it is not possible to prescribe specific procedures for revision that will hold equally for all devices and inventories. Again, the practical resolution is to evaluate and revise inventories according to their effects upon the user.

Should we revise the content of interest inventories to reduce their apparent age, race, and social class bias? Strong (1943), Kimball, Sedlacek, and Brooks (1971), Lewis and Sedlacek (1972), and others have demonstrated that interest inventory profiles vary with age, social class, and race. If adjustments are made to eliminate alleged sex bias, then similar adjustments should be made for the other major forces of socialization. The reconstruction of inventories to eliminate the influence of sex, race, age, and social class would probably lead to an inventory with lowered validity, and an inventory that assessed largely a person's innate potential or heredity. That possibility appears less desirable than the current situation—more validity and making people aware of the influence of their life history.

Can we develop a definition of sex fairness and also secure consensus among experts and lay people? The answer appears to be no. Linn (1973), after reviewing a variety of statistical proposals for estimating test fairness in selection, concludes that "there is more than one reasonable definition of test fairness and these definitions are in conflict . . . we must look beyond a simple technical resolution of the problem." In a closely related report, Hoepfner and Strickland (1972) also review the methods for establishing test bias and come to the same conclusion. Nevertheless, they define test bias as an item-by-race interaction in an analysis of variance design, although their empirical results were ambiguous. Their evidence does not clearly support the hypothesis "that the differential familiarity, relevance, and interest-arousing aspects of items underlie the observed group differences" between blacks, whites, Orientals, and Mexican Americans. Instead, the results suggest that the Stanford Achievement Test is "biased in favor of Orientals"—an implausible conclusion—since few differences involved whites and many involved Orientals. In a similar paper, Darlington (1973) argues that "there can be no generally applicable objective statistical definition of a culture-fair test and instead we should attempt to develop tests with maximum construct validity."

SUBSTANTIVE ISSUES

There is a large body of data that clearly demonstrates that men and women (boys and girls) respond to many test items in divergent ways. Campbell's new manual (1974b) for the Strong-Campbell Interest Inventory reports some outstanding examples of sex differences. The manual for the Vocational Interest Profile (ACT, 1970) provides similar data in a more indirect fashion. For example, the average Household scale score for a national female sample is about 1 standard deviation higher than the average score for males. The average Agriculture scale score for men is almost 2 standard deviations higher than the average score for women. In the norms manual (ACT, 1971), only 10 percent of the college women rate themselves above average in "mechanical ability," whereas 57 percent of the men rate themselves above average. Perhaps the most persuasive data are provided by Hansen and Johansson (1972), who developed a set of six Holland scales of equal length by using the women's form of the Strong and samples restricted to women. Table 9 shows that when large samples of women were rescored on these scales, their profiles exhibit the same gross trends observed in SDS profiles: Women still prefer Artistic and Social occupations and activities and still dislike Realistic and Enterprising items. These data are strong evidence that interest profiles are largely a function of the person and not of the inventory. Data such as these have been overlooked and ignored because few people were interested earlier and because the conversion of raw scores by

TABLE 9.—*Raw score means and standard deviations of women-in-general used for conversion to standard scores*

Holland scales in the SVIB	Set I[a] Mean	Set I[a] S.D.	Set II[b] Mean	Set II[b] S.D.
Realistic	−.31	5.53	−1.49	7.63
Investigative	1.18	6.09	2.72	8.07
Artistic	4.39	6.10	6.09	8.49
Social	3.18	5.02	4.18	6.93
Enterprising	−.12	5.20	.20	7.39
Conventional	1.10	5.56	−1.05	7.57

[a]All Set I scales contain 14 items.
[b]All Set II scales contain 20 items.

Source: J. C. Hansen and C. B. Johansson, The Application of Holland's Model to the Strong Vocational Interest Blank for Women, *Journal of Vocational Behavior*, 1972, 2, 479-493.

various normative procedures to special scale scores separates test users from the more concrete evidence. Similar data are contained in other manuals and normative tables for other interest inventories and aptitude tests (Bennett, Seashore, & Wesman, 1959).

These data support the conclusion that equal treatment (single form of an inventory) does not lead to identical outcomes. Consequently the best possible outcomes we can hope for are different but equally useful outcomes for men and women. Different kinds of people will get different kinds of help from taking an interest inventory. The best inventory will provide as many benefits for one group as another. This conclusion is a restatement of how many people conceive the evaluation of psychotherapy. People come to therapy for different purposes; consequently evaluations should be in terms of those purposes. In the SDS study reported earlier, the effects appear to be appropriate for each sex: broadening goals for girls and focusing goals for boys, because girls' goals have been constricted while boys may have had too many options to cope with easily.

Three other pieces of substantive knowledge are relevant and important to recall: (1) The little information we do have about the effects of inventories is generally positive, (2) the magnitude of the effects is small, and (3) there is abundant naturalistic observation to suggest that vocational aspirations are sex typed at an early age and very resistant to manipulation. For instance, elementary schools are stocked primarily with women as role models, yet the distributions of small boys' choices show no drift toward feminine choices. To the contrary, the masculinity of boys' choices increases to a peak at about the ages of 16 to 18. Little girls' choices show no appreciable drift either. At older ages, college students drift from opposite-sex fields to fields dominated by their own sex (Astin & Panos, 1968).

THEORETICAL ISSUES

A strong case can be made for the usefulness of typologies for organizing occupational and personal data (Maddi, 1968; Holland, 1973b). When the present problem is seen in the context of a theoretical typology, *sexual socialization is only one of several major cultural influences* that shape a person's vocational fitness and aspirations (what aptitudes will be developed or ignored, what personality traits and values will be reinforced or deprecated, what lifestyles will be encouraged or discouraged). For example, a person's social class origin, racial and religious background, parental occupation, father's values and goals, and mother's child-rearing attitudes all influence the personal development and occupational aspirations of children, adolescents, and adults. (See Grandy, 1973; Holland, 1973b; Kohn & Schooler, 1969; Nafziger, Holland, Helms, & McPartland, 1972; Werts, 1968; Whitney, 1970.)

Grandy's recent study suggests the power of parental influence. Grandy predicted the expressed occupational choices (one of six categories) of 487 college students with moderate efficiency (45.3 percent predicted category, but not cross-validated), using only eight family variables in a discriminant analysis. This level of efficiency is comparable with that obtained from the direct use of interest inventories. In addition, it is important to realize how resistant the effects of socialization are to all sorts of manipulation, including the therapies, traumatic events, and social movements.

With this background, it appears more rational to use the strengths and weaknesses due to the typing effects of a person's life history than to ignore the outcomes of such experience. Such uses do not mean always giving in to one's past; they mean, rather, learning how to make constructive use of that experience. Inventories not only tell us where we have been (an inventory is the record of a person's reinforcement experience) but also point out many closely related possibilities. More adventurous persons can use classifications to plan the attainment of more divergent goals.

EDUCATIONAL ISSUES

It may be more helpful to include in auxiliary materials special warnings and advice about the limitations of interest inventories than to engage in subtle revisions or to conduct long-range inventory educational programs for counselors, parents, and teachers. For example, different inventories could include statements about their possible or known limitations in the same way many now have a disclaimer about interest profiles having little to do with aptitude. Also, the auxiliary materials might have much more effect than changing *man-made satellite* to *person-made satellite* or *draftsman* to *drafter*. Auxiliary materials could discuss sexism and career development along with the effects of age, social class, and physical defects. Persons choosing to resist these influences would be guaranteed automatic defensive ammunition rather than have to depend upon enlightened counselors, parents, teachers, or employers.

RECOMMENDATIONS AND STRATEGIES

The suggestions presented in this section are aimed at improving the quality of interest inventories. Concern with overall quality is preferred to a narrow focus on sex bias for many reasons:

1. Sex bias is only one of many possible defects in an interest inventory.
2. The assumed signs of sex bias have already been eliminated or were never present in most inventories. The Strong has undergone a radical revision—one form is used for both sexes, men and women are scored for all scales, and all scales have been reorganized according to a theoretical scheme. The Kuder has followed suit (men and women are scored for all scales). All other inventories use a single form for both sexes, use norms or absolute scores, and usually provide a simple to elaborate occupational classification scheme to show a person a wide range of occupational options. In addition, the SDS, despite its positive experimental tests, has undergone some minor revision: additional occupations were added for women; some titles were revised to eliminate sexual content; and *the current edition of the SDS* contains two paragraphs that alert people to the influences of age, sex, social class, and religious background in an effort to help them cope with these influences.
3. The elimination of sex bias focuses on a negative goal. We should be more concerned with the development of inventories that foster everyone's best interests.
4. Nearly all proposed revisions are controversial, because we now lack clear or gross evidence of sex bias. In addition, some proposed solutions exclude others. For example, the introduction of norms for each sex probably increases exploratory behavior but simultaneously reduces an inventory's predictive validity. In short, revisions have both benefits and costs.
5. No one needs to be persuaded about improving the quality of interest inventories, but many still find sex bias difficult to appreciate or comprehend.

The following sections outline some practical plans for making interest inventories more effective. Because we have so little evidence about the actual impact of these devices, it is assumed that these proposals are at least consistent with current knowledge.

IMPROVING INVENTORIES

Among the many possibilities for constructive change, the development or revision of auxiliary materials appears most practical. Although most inventories are accompanied by such materials

now (principles of career development, classification schemes, warning about limitations, and next steps), such materials can be revised to cope with the special limitations of each individual inventory—its assumed sex, age, or social status biases; how to expand the options suggested by the inventory; and the role of a person's life history in his or her interest development. Additions or revisions of this kind could be made quickly and cheaply. Equally important, better auxiliary materials should be more influential than the changes involved in revising inventory items or in devising special scoring or classification procedures which would probably be too subtle to be noticed by most people.

A second possibility is to encourage the creation of inventories that provide the full range of options for all people. The more comprehensive the range of occupational options an inventory presents, the less likely it is to be biased pro or con men versus women, old versus young, or high versus low social status, because everyone is treated alike—or at least everyone has an opportunity to see all options. Inventories developed only for men or women, young or old people, or people destined for low-level jobs (or high-level jobs) may limit a person's occupational outlook with regard to both level and kind of occupation. Such limitations appear to be automatically restrictive, but some studies of their actual effects seem desirable.

A third need is to encourage the experimental examination of the influence of interest inventories. So far they get positive scores, but it would be helpful to learn whether or not special norms, classifications, item revisions, or any other revisions have the assumed and desired effects. This kind of study is sorely needed to sort out what we know from what has been assumed. There is no clear method for the creation of the best inventory, but experimental studies do provide a method for evaluating a great range of psychometric procedures against a common set of criteria about their influence.

Finally, authors and publishers should be encouraged to review their interest inventories for the following purposes:

1. Does the inventory item pool appear to favor men or women? If so, can the pool be balanced? *Should* the pool be balanced: are there any other solutions?
2. Is the range of options as large as possible and still financially feasible and practical to use?
3. Do options cover all levels of talent and a full range of content or kind?
4. Do items permit respondents to indicate interests they have *not yet* experienced but feel able and eager to explore?
5. Are there any items that are not in the best interests of any group, no matter how small?
6. Are occupational options oriented only to the past?
7. Is there a consensus of users about inventory defects that can be remedied or at least softened in printed auxiliary materials?

COUNSELOR TRAINING

Counselors can participate most constructively in the use and interpretation of interest inventories by continuing to play their traditional role, by engaging more frequently in talent stimulation, by using interest inventories and classifications to plot career development, and by using occupational classifications to aid a client's personal development.

Traditional role. In the past it has been customary to describe the counselor's role in vocational counseling as that of a somewhat objective integrator and stimulator of wise vocational decisions who provided insight, encouragement, and information. Other interventions (computer-assisted counseling programs, inventories, workbooks, and tests) are assumed to play similar roles. Although counselors cannot be objective any more than mothers or fathers can, they can and do serve as advocates of the individual. Other interventions can also play a helpful role by treating everyone in the same way, showing all the alternatives, providing all the information, and avoiding built-in limitations that may restrict the perspectives of users.

Personal and impersonal interventions should work for the individual. Any other role would be less helpful and probably destructive. Occasionally teachers and parents want to enlist counsel-

ors to work for particular decisions. In a similar vein, a few women's rights groups want counselors to advocate the skilled trades for women and office occupations for men. Sympathetic as some counselors may be to such pleas, a positive response would reduce their ability to serve the best interests of the individual and compromise their professional responsibility. It is still not possible to help a person explore alternatives and press for a special alternative at the same time. Vocational interventions of all kinds can serve people best by helping them to freely assess their current assets and liabilities and to prepare for the life and vocation they want to pursue, and by providing information that will stimulate them to attain greater vocational fulfillments.

In this connection it is important to recall that interest inventories were developed in large part to replace the subjective and unreliable advice of well-meaning friends and relations. And, unlike friends and relations, the reliability and validity of the information provided by interest inventories is amenable to corrective action by empirical and public tests.

Talent stimulation. The constricted life experience of many—perhaps most—women suggests that they need to be encouraged to try out the full range of their interests and talents. Like other oppressed groups, women often have no experience with which to test their potentials. Dailey's training materials (Dailey, 1968) may assist women in discovering their talents and future possibilities. Counselors should also learn how to help women cope with a variety of job-related problems. For example, Bem and Bem (1973) have prepared a manual for counselors to help women gain new perspectives on themselves, their careers, and their families. Likewise, Pearlman and Resnikoff (1973) have prepared a leader's guide to accompany a stimulus film for women, *Back to School, Back to Work*. These and similar materials should prove to be as influential as interest inventories.

Planning career development. Interest inventories can be used to help people plan their career development rather than as devices to be abandoned or revised to secure more desirable scores. For example, if a woman receives a low Realistic score on the SDS, a low Mechanical score on the Kuder, or low skilled trades scores on the SVIB, she can with the help of a sensitive counselor use such information to plan what she wants to do about such scores and her life goals. She may decide that she still wants to try the skilled trades. In that case her low scores and their scale content can be employed to learn some of the things she must learn to like and do well, where to get the training and a part-time or full-time first job, and what to expect. In short, a person's scores are intended to be used to his or her advantage and should not be regarded as alien information to be denied. Many counselors perform these functions well now; we need many more who will do so.

Using classifications. Occupational classifications or maps can be used to help people see the psychological distance between their present job or interests and more remote objectives, and to help them plan accordingly. Cole (1973) has demonstrated the similarity of structure between men's and women's vocational interests, and Cole and Cole (1970) have summarized a method of mapping occupations for counseling purposes. Occupational classifications can be used in the same way.

For instance, Holland's classification (Holland, 1973a) can be used for a variety of purposes, including the following: (1) understanding the differences between divergent choices, (2) finding similar vocational alternatives when one alternative is blocked because of lack of opportunity, (3) finding similar alternatives but at different levels of competency, and (4) planning successive jobs to reach a more remote goal. The *Dictionary of Occupational Titles* can be used in the same way, but it is an unscientific and unwieldy encyclopedia.

In conjunction with interest inventories, correlated classification or mapping schemes make it possible to show women and men the full range of vocational possibilities. Unfortunately, at the present time counselors receive relatively little training or encouragement to perform this valuable activity.

RESEARCH

Although doing research is a long-range strategy, it provides public evidence for clarifying and revising our ideas about vocational behavior. In the context of the present problems, two kinds of closely related studies appear especially useful:

1. Evaluative studies to develop a clearer knowledge of how vocational interventions and their revisions affect people. So far, we have only a few experimental studies of this type (Krumboltz & Schroeder, 1965; Redmond, 1972; Zener & Schnuelle, 1972). These studies appear especially helpful for learning about the effects of specific revisions of inventories, tests, and simulations.
2. Theoretical and substantive studies to develop a better knowledge of the development of vocational aspirations—especially the determination of the most potent influences at younger age levels.

Other goals might involve research to locate men and women who have moderate to high potential for jobs dominated by the opposite sex. Such studies might include—

1. Longitudinal studies of persons who have made the transition from female- to male-dominated jobs, or vice versa, with different degrees of achievement and satisfaction. Do men with high femininity scores make the transition to office jobs more easily than men with high masculinity scores? Do MF scales provide a useful index of socialization and occupational flexibility? Studies of originality repeatedly imply that femininity is a correlate of originality in men (Barron, 1953). Such studies would be a rich source of ideas about critical personal traits, environmental supports, and barriers that lead to or block transitions between sexually stereotyped jobs.
2. Comparisons of men and women holding the same job. Are their interests alike? Do they perform equally but make use of different clusters of personal competencies and personality traits?
3. Applications of current theories of career development to men and women in the same occupation. Do the theories need revision?
4. Experimental tests of the use of Dailey's training materials (Dailey, 1968). Will such tests identify women with skilled trades talents?

In other research, we need to examine and test ideas like the following:

1. Will school systems with no sex restrictions on course selection produce students with a more heterogeneous distribution of vocational interest profiles?
2. Will parents without narrow sex role preferences produce children with less stereotyped choices and less divergent interests?
3. Will communities that provide a variety of nondiscriminatory part-time work activities for boys and girls encourage a greater variety of vocational aspirations?
4. As sexism decreases in society, will the distributions of men's and women's occupational choices and inventory codes or profiles become more similar? The Strong, Kuder, and similar instruments could provide useful criteria for assessing the socialization experiences and restrictions of men and women of different socioeconomic status, living in different communities and societies, and so on.

We need more studies of why the interest inventories work so well. Such studies would tell us what interventions affect the vocational interests of young people and at what ages. For example, a careful and comprehensive study of the SDS and its rationale should allow us to specify with considerable precision the situational forces that create specific patterns of preferred activities, competencies, vocational preferences, and self-conceptions. When that task is accomplished, it would be possible to outline more potent interventions for creating changes in vocational aspirations or interest.

The potential power that this knowledge should bring raises several ethical issues. Who should control such power and what social groups should participate in such decisions? This issue does not seem important now because current interventions to reduce occupational

stereotyping are coming too late and appear to have little impact. For example, opening auto mechanics courses to women will induce only a few women to enter. A more practical approach would be to change men's and women's conceptions of work and themselves long before such opportunities arise. So far, preschool experiences, parents, and relatives appear to hold the key to the formation of work roles and self-attitudes, although subsequent experience can soften or modify these conceptions of work and self.

SOCIAL ACTION

The vocational options for all persons can be increased by several social actions. One short-range strategy is the removal of educational or experiential barriers that prevent girls and women, blacks, and other groups from learning about their interests and competencies and from incorporating them fully into their self-definition. Actions based on this strategy are on the increase—opening all educational experiences to men and women (shop and home economics courses, etc.), reducing the use of sex-stereotyped activities and classroom materials in elementary schools, eliminating sex discrimination in part-time jobs for young people so that both boys and girls can develop a more comprehensive and accurate self-appraisal. Any action that will broaden everyone's prevocational experiences will influence interest inventories.

Professional commissions should continue to stimulate discussion and to press for rationality and fair play. In this regard, commissions might be more influential and productive if they had broader or more balanced representation, including consumers and test publishers. (The OE Commission employed 14 women and 3 men.) It is difficult to think of someone who clearly lacks a conflict of interest, but it is relatively easy to insure that the major points of view are at least represented. Some continued formal reporting appears helpful. At the same time, some informal, unreported private meetings of commissions that are more representative of everyone concerned may be more helpful.

Legislative action designed to improve vocational services or to remedy bias appears especially inappropriate. The definitions of poor or biased service appear to hinge on subjective judgment except in the most blatant cases. Until we have a consensus about the definitions, causes, and remedies for biased services, legislative activity will create a new trap by promoting a destructive group of principles.

SOME CONCLUSIONS

The following conclusions attempt to summarize my interpretation of the data and my experience as a researcher and practicing vocational counselor. I would have more confidence in these conclusions and those of other participants in this controversy if we had abundant and explicit evidence. As it is, we must do the best we can with what we have.

1. There is no evidence of sex bias in interest inventories if it is assumed an unbiased criterion must be used to make such determinations.
2. So far, charges of sex bias in interest inventories rest on imagined effects and words assumed to be offensive to women.
3. Inventories should be evaluated for their sex fairness—do they have effects or outcomes for both sexes that are about equal in number and magnitude, although such effects may differ in kind?
4. We lack consensual definitions of both sex bias and sex fairness, although we may be able to get some consensus about sex fairness.
5. Legal action is unwarranted until some clear and compelling evidence of a general sex bias in interest inventories is marshaled.
6. Sex bias is only one of many *potential* biases; other major influences include social class, race, and religion.
7. A strategy of improving inventory effects for everyone is superior to a focus on sex bias.
8. The distributions of vocational aspiration among men and women differ because men and women have different life histories, *not* because interest inventories possess sex-biased characteristics. Changing women's lives will change their scores.

9. Many proposals to revise inventories are equivalent to changing thermometers until you find one that lowers your temperature.

10. Interest inventories are assessment, not social-action, devices. Attempts to make them otherwise are an anti-intellectual, antiscientific, destructive activity.

11. Inventories are being made more useful by a continuation of many current trends and activities—creating more options, improving auxiliary materials, performing more studies of the real rather than imagined effects, and so on.

REFERENCES

American College Testing Program. *Handbook for the ACT Career Planning Program.* Iowa City: Research and Development Division, ACT, 1970.

American College Testing Program. *Career Planning Profile National Norms.* Iowa City: Research and Development Division, ACT, 1971.

Association for Measurement and Evaluation in Guidance. AMEG commission report on sex bias in interest measurement. *Measurement and Evaluation in Guidance,* 1973, 6, 171-177.

Astin, A. W., & Panos, R. J. *The educational and vocational development of American college students.* Washington: American Council on Education, 1968.

Barron, F. Complexity-simplicity as a personality dimension. *Journal of Abnormal and Social Psychology,* 1953, 48, 163-172.

Bem, S. L., & Bem, D. J. Training the woman to know her place: The social antecedents of women in the world of work. Pennsylvania Department of Education (Box 911, Harrisburg, Pa. 17126), 1973.

Bennett, G. K., Seashore, H. G., & Wesman, A. G. *Manual for the Differential Aptitude Tests.* New York: Psychological Corporation, 1959.

Campbell, D. P. *The results of counseling: Twenty-five years later.* Philadelphia: Saunders, 1965.

Campbell, D. P. *Handbook for the Strong Vocational Interest Blank.* Stanford, Calif.: Stanford University Press, 1971.

Campbell, D. P. Women deserve better. *Personnel and Guidance Journal,* 1973, 51, 545-549.

Campbell, D. P. "Give me one of those interest tests so I can see what I should be." In *Measurement for self-understanding and personal development* (Proceedings of the 1973 Invitational Conference on Testing Problems). Princeton, N. J.: Educational Testing Service, 1974. (a)

Campbell, D. P. *Strong Vocational Interest Blank: Manual for the Strong-Campbell Interest Inventory.* Stanford, Calif.: Stanford University Press, 1974. (b)

Clark, K. E. *The vocational interests of nonprofessional men.* Minneapolis: University of Minnesota Press, 1961.

Cole, N. S. On measuring the vocational interests of women. *Journal of Counseling Psychology,* 1973, 20, 105-112.

Cole, N. S., & Cole, J. W. *An analysis of spatial configuration and its application to research in higher education.* (ACT Research Report No. 35) Iowa City: American College Testing Program, 1970.

Craven, E. C. *The use of interest inventories in counseling.* Chicago: Science Research Associates, 1961.

Crites, J. O. *Vocational psychology.* New York: McGraw-Hill, 1969.

Dailey, J. T. *Instructor's manual for talent training materials.* Alexandria, Va.: Allington Corporation, 1968.

Darlington, R. B. Is culture-fairness objective or subjective? Paper presented at annual convention of American Educational Research Association, New Orleans, 1973.

Gesinde, S. A. Congruence of basic personal orientation with vocational training. Doctoral dissertation, Teachers College, Columbia University, 1973.

Gottfredson, G. D., & Holland, J. L. *Vocational choices of men and women: A comparison of predictors from the SDS.* (Research Report No. 175) Baltimore: Center for Social Organization of Schools, Johns Hopkins University, 1974.

Grandy, T. G. The influence of the family upon the expressed occupational choices of college freshmen. Master of arts thesis, College of Education, University of Iowa, 1973.

Hansen, J. C., & Johansson, C. B. The application of Holland's vocational model to the Strong Vocational Interest Blank for Women. *Journal of Vocational Behavior,* 1972, 2, 479-493.

Harmon, L. W. Sexual bias in interest measurement. *Measurement and Evaluation in Guidance,* 1973, 5, 496-501.

Helms, S. T., & Williams, G. D. *An experimental study of the reaction of high school students to simulated jobs.* (Research Report No. 161) Baltimore: Center for Social Organization of Schools, Johns Hopkins University, 1973.

Hewer, V. H. Evaluation of a criterion: Realism of vocational choice. *Journal of Counseling Psychology,* 1966, 13, 289-294.

Hoepfner, R., & Strickland, G. P. *Investigating test bias.* (CSE Report No. 74) Los Angeles: Center for the Study of Evaluation, UCLA, 1972.

Holland, J. L. *Professional Manual for the Self-Directed Search.* Palo Alto, Calif.: Consulting Psychologists Press, 1972.

Holland, J. L. *Making vocational choices: A theory of careers.* Englewood Cliffs, N. J.: Prentice-Hall, 1973. (a)

Holland, J. L. Sexism, personal development, and the Self-Directed Search. Unpublished paper, Center for Social Organization of Schools, Johns Hopkins University, 1973. (b)

Holland, J. L. Some guidelines for reducing systematic biases in the delivery of vocational services. *Measurement and Evaluation in Guidance,* 1974, 6, 210-218.

Holland, J. L., & Gottfredson, G. D. *Applying a typology to vocational aspirations.* (Research Report No. 176) Baltimore: Center for Social Organization of Schools, Johns Hopkins University, 1974.

Huth, C. M. Measuring women's interests: How useful? *Personnel and Guidance Journal,* 1973, 51, 539-545.

Kimball, R. L., Sedlacek, W. E., & Brooks, G. C., Jr. *Black and white vocational interests on Holland's Self-Directed Search.* (Research Report No. 6-71) College Park: Counseling Center, University of Maryland, 1971.

Kirchner, E. P., & Vondracek, S. I. What do you want to be when you grow up? Paper presented at annual convention of Society for Research in Child Development, Philadelphia, 1973.

Kohn, M. L., & Schooler, C. Class, occupation, and orientation. *American Sociological Review,* 1969, 34, 659-678.

Krumboltz, J. D., & Schroeder, W. W. Promoting career planning through reinforcement. *Personnel and Guidance Journal,* 1965, 44, 19-26.

Kuder, G. F. *General Manual, Kuder Occupational Interest Survey, Form DD.* Chicago: Science Research Associates, 1971.

Lewis, A. H., & Sedlacek, W. E. *Socioeconomic level differences on Holland's Self-Directed Search.* (Research Report No. 1 '2) College Park: Counseling Center, University of Maryland, 1972.

Linn, R. L. Fair test used in selection. *Review of Educational Research,* 1973, 43, 139-161.

Long, M. E. Holland's Self-Directed Search: Development and evaluation of an Australian form. Unpublished paper, University of Melbourne, 1972.

Maddi, S. R. *Personality Theories.* Homewood, Ill.: Dorsey Press, 1968.

Nafziger, D. H., Holland, J. L., Helms, S. T., & McPartland, J. M. *Applying an occupational classification to a national representative sample of work histories of young men and women.* (Research Report No. 132) Baltimore: Center for Social Organization of Schools, Johns Hopkins University, 1972.

Nunnally, J. C. *Psychometric Theory.* New York: McGraw-Hill, 1967.

Pearlman, J., & Resnikoff, A. *Leader's Guide to "Back to school, back to work: A stimulus film for women."* American Personnel and Guidance Association (Washington, D.C. 20009), 1973.

Prediger, D. J., Roth, J. D., & Noeth, R. J. *A nationwide study of student career development: Summary of results.* (ACT Research Report No. 61) Iowa City: American College Testing Program, 1973.

Redmond, R. E. Increasing vocational information seeking behaviors of high school students. Doctoral dissertation, University of Maryland, 1972.

Schlossberg, N. K. A framework for counseling women. *Personnel and Guidance Journal,* 1972, 51, 137-143.

Siegel, C. L. Sex differences in the occupational choices of second graders. *Journal of Vocational Behavior,* 1973, 3, 15-19.

Spence, J. T., & Helmreich, R. The Attitudes Toward Women scale. Abstracted in *JSAS Catalog of Selected Documents in Psychology,* 1972, 2, 66.

Stein, A. H., & Bailey, M. M. The socialization of achievement orientation in females. *Psychological Bulletin,* 1973, 80, 345-366.

Strong, E. K., Jr. *The vocational interests of men and women.* Stanford, Calif.: Stanford University Press, 1943.

Super, D. E., & Crites, J. O. *Appraising vocational fitness.* (Rev. ed.) New York: Harper & Row, 1962.

Tiedeman, D. V., O'Hara, R. P., & Mathews, E. Position choices and careers: Elements of a theory. Harvard Graduate School of Education (13 Kirkland St., Cambridge, Mass. 02138), 1958. (Mimeographed)

U. S. Department of Health, Education, and Welfare, Office of Education. *A look at women in education: Issues and answers for HEW.* (Report of the Commissioner's Task Force on the Impact of Office of Education Programs on Women) Washington: Office of Education, 1972.

Weingarten, M., & Sirkis, R. The application of Holland's theory to the development of vocational choice, Unpublished undergraduate paper, Department of Social Relations, Johns Hopkins University, 1973.

Werts, C. E. Paternal influence on career choice. *Journal of Counseling Psychology,* 1968, 15, 48-52.

Whitney, D. R. Predicting vocational interests of high ability students. Unpublished paper, 1970.

Zener, T. B., and Schnuelle, L. *An evaluation of the Self-Directed Search.* (Report No. 124) Baltimore: Center for Social Organization of Schools, Johns Hopkins University, 1972.

Technical Aspects: Problems of Scale Development, Norms, Item Differences by Sex, and the Rate of Change in Occupational Group Characteristics — I

/3

Lenore W. Harmon
UNIVERSITY OF WISCONSIN—MILWAUKEE

ABSTRACT

The basic premise is that our culture's practice of defining work as masculine or feminine has influenced the techniques of interest measurement to an extent that may be unwarranted. All the elements of interest inventory construction—item selection, scale development, and norming—have been affected by the assumption that women and men play vastly different occupational roles. Some inventories have separate item pools for each sex. Empirically developed occupational scales are usually developed by using only one sex in the criterion group. Homogeneous scales are usually normed separately by sex.

The basic goal of interest measurement is to help individuals explore their interests in comparison with others' and to promote good life planning. If any of the practices that seem to

72

imply sex bias in interest measurement are not actually necessary to these goals, then sex bias does in effect exist in interest inventories. It is necessary to design research to explore whether items, scales, and norms can be the same for both sexes or whether they need to be developed separately for each sex. If interest measures developed without regard for sex are as effective as those now in use, the assumption on which current interest techniques are based—that vocational behavior is related strongly to sex and that interest measurement techniques must take account of that relationship—is unfounded.

INTRODUCTION

The world of work is divided into two categories, "women's work" and "men's work"; anyone who does not know the difference can consult such widely divergent sources as children's primers (Women on Words and Images, 1972), the local want ads, or U.S. Department of Labor statistics (1969). Individual differences between men and women have been cited as the reason for this dichotomy (Parsons, 1965), as have politics and economics (Bird, 1968; Firestone, 1970; Millett, 1969). Actually, there are few jobs that require skills and abilities possessed exclusively by one sex or the other. In fact, there are few such skills (Lewis, 1968). Thus it follows that there are few instances in which it is appropriate for an individual "to limit . . . his or her consideration of a career solely on the basis of gender," as stated in the NIE definition.

Historically, the oldest interest inventory still in use, the Strong Vocational Interest Blank (SVIB), was developed in the 1920's and 1930's on the assumption that there are two categories of work and two categories of workers. Reporting on disappointing early attempts to measure women's interests, Strong (1943, p. 129) commented, "The writer's hunch is that it will be found that men can be better differentiated respecting a larger number of occupations than can women. The primary reason for this belief is that the interest technique necessitates a fairly homogeneous criterion group. At the present time far too many women enter an occupation as a stopgap until marriage. Consequently, they take a job because it is convenient, not because they intend to continue in it indefinitely. The result is that most occupations contain a considerable number of women who would not be there if they had selected an occupational career as men do. Any sampling of such occupations gives a rather heterogeneous group of women. Occupational scales based on such criterion groups cannot be expected to differentiate very well."

Strong developed separate inventories for men and women. His assumptions probably reflected the convictions of his time, but they also influenced future researchers. The latest *Mental Measurements Yearbook* (Buros, 1972) showed that the male form of the SVIB had been utilized in 1,099 studies since it was introduced in 1927, and the female form in 168 studies since it was introduced in 1933. About 6 times more research has been directed toward studying men's interests than women's interests, if we make the questionable assumption that each reported study represents an equal unit of research. Strong assumed that women's interests were difficult to measure and different from men's interests, and he seems to have convinced a majority of researchers and inventory developers. The interest inventories available today rest on many of the same assumptions that he utilized.

One purpose of this paper is to consider how the technical aspects of interest measurement can contribute to sex bias in that interest inventories could be used to limit consideration of a career on the basis of sex. Another purpose is to suggest guidelines for evaluating interest inventories for sex bias and for developing interest inventories that minimize sex bias.

OVERVIEW OF INTEREST MEASUREMENT TECHNIQUES

There are usually three major technical steps in developing any interest inventory, and sex bias can enter at any point. First, a pool of items is selected; second, scales are developed; finally, the scales are normed.

ITEMS

Most interest inventory items utilize occupational names or occupational activities as items. Names of school subjects, nonoccupational activities, or personal characteristics are used to a lesser extent. If the items imply sexual stereotyping in occupations (as "police*man*" or "sales*lady*"), they promote sexual bias both in the responses they elicit and in the image of the occupation they project. Strong (1962) suggested guidelines for selecting good items for interest inventories, but his assumptions and his measurement technique did not lead him to include the elimination of sex bias.

SCALE CONSTRUCTION

After a set of items has been developed, it is administered to a group of people. The responses of this group to the set of items provide the basic data from which interest inventory scales are constructed. There are basically two kinds of interest inventories and two ways to construct them. An understanding of the two types of scales and the way they are constructed is necessary to an understanding of the potential for sex bias in each type. Scales may be based on either external or internal criteria. The composition of the group used to provide data for scale building and the way those data are treated determine the type of scale that results.

Scales based on external criteria utilize the item responses of a group of people already employed in a specific occupation (the criterion group) to provide a comparison either with a reference group of people employed in a large number of occupations or with the individual being tested. These scales are called occupational scales and named after the occupation represented in the criterion group. A review of all interest inventories listed by Buros in the two most recent editions of the *Mental Measurements Yearbook* (1965, 1972) revealed that only 5 of the 52 contain occupational scales based on external criterion groups. The five include the Kuder Preference Record—Occupational (Form D), which is no longer on the market; the Kuder Occupational Interest Survey (Form DD); the Minnesota Vocational Interest Inventory; the Strong Vocational Interest Blank for Men (Form T399); and the Strong Vocational Interest Blank for Women (Form TW398).

Since these inventories are widely used, it is worthwhile to examine their scale-building methods closely. The occupational scales of the Kuder Form D, the Minnesota Vocational Interest Inventory, and both forms of the SVIB are developed in a similar manner. For each item, the percentage of an occupational criterion group who make each response is compared with the percentage of a reference group who make each response. For example, on the SVIB item "biologist," individuals may respond "Like," "Indifferent," or "Dislike." To determine whether that item should appear on a scale for female veterinarians, a comparison is made between the percentage of the occupational criterion group (female veterinarians) and the percentage of the reference group (women-in-general) who make each of the three responses. Table 1 illustrates how weights are assigned to each response for the female Veterinarian scale. Only items that differentiate between the two groups by a large percentage—usually 15 percent or more—are included.

TABLE 1.—*Responses to the SVIB item "biologist"*

	Like	Indifferent (%)	Dislike (%)
Veterinarians (Female)	90	9	9
Women-in-General	46	29	25
Differences	+44	−20	−24
Scale weights	+1	− 1	− 1

The occupational scales of the Kuder OIS (Form DD) also utilize criterion groups of people employed in an occupation. However, the responses of the individual taking the inventory are compared with those of the criterion group and expressed as a type of correlation coefficient between the two (Zytowski, 1973). No reference group is used.

Most interest scales based on external criteria utilize occupational groups of one sex or the other but not both. All interest scales that have been developed from external criteria rest on the assumption that sex differences are a very important consideration in building the scales.

Scales based on internal criteria, also called homogeneous scales, are developed by using some method of clustering the interest inventory items. The clustering method may reflect the subjective judgment of the test developer, the dimensions of a theoretical model, or the results of a factor analysis. The important difference between homogeneous scales and occupational scales stems from the fact that the clustering process does not make use of an external criterion, such as membership in an occupational group, in assigning items to scales. The group of people tested to provide basic data about the inventory items are not specified by occupation, although they may be specified by age or sex. Their responses are used to provide information

on how the items cluster. Items that are highly correlated for the group tested are placed together in scales. The resulting scales are usually more limited in number than occupational scales based on an external criterion and they have names that are more general (Mechanical, Clerical, and Social as opposed to Engineer, Secretary, and Social Worker).

Another important difference between the two types of scales is that most homogeneous scales based on internal criteria are not sex specific, as are the occupational scales. These internally referenced scales, which are designed to reflect general dimensions of interest present in a general population, usually make no assumptions about sex, and bias is not introduced in the scale-building process. Bias might be introduced, however, if the group used to develop item statistics for the clustering procedure were atypical in some way (for example, if it consisted of only one sex). Generally, bias is not introduced in this way; more potential for bias in inventories developed from internal criteria exists in scale norming than in scale building.

NORMING SCALES

Occupational scales based on external criterion groups of people employed in the occupation usually utilize the occupational criterion group as a norm or comparison group. When an occupational scale is employed, the score of an individual reflects some degree of similarity to or dissimilarity from men or women in the occupation. Thus a degree of concurrent validity is built into the externally referenced scales. The assumption that occupational scales require separate criterion groups by sex leads to scales that require separate norming by sex if the scales are to make any interpretive sense.

The norm group for internally based scales is usually the same type of general population group utilized in scale building. The age range of the norm group is the same as that of potential test takers. The scales have implied or demonstrated content and construct validity, but there is neither concurrent nor predictive validity associated with the comparison or norm group. The homogeneous scales of inventories of this kind present a sort of occupational typology (which may or may not be carefully documented in content and construct statistics). They show individuals how they compare with others who are similar in age or sex, or both. It has seemed reasonable to present separate norm groups by sex on this kind of interest inventory because the distributions of scores for men and women are usually different. However, it is also reasonable to ask whether the use of separate norm groups by sex introduces sex bias.

ISSUES RAISED

This review of techniques raises many issues about potential sex bias in interest measurement. First, it is important to establish whether there are sex differences in response to items, because item responses are the building blocks of interest measurement.

Another related issue is whether occupational scales need to be developed for each sex separately. Why are many homogeneous scales developed without reference to the sex of the respondents?

It follows that we need to know whether either occupational or general norm groups should be separated by sex.

The goals of interest measurement are to help individuals explore their interests in comparison with others' and to promote good life planning. If any of the practices that seem to imply sex bias in interest measurement are not actually necessary to these goals, then sex bias does exist in interest inventories.

ISSUES RELATED TO ITEMS

If there are no sex differences at the item level, none of the interest measures built upon those items need to take account of sex. If there are sex differences at the item level, it is important to determine whether they are related to either item content or item format and whether separate pools of items are needed for men and for women.

Sex differences in item response. Campbell (1974) has been able to use the large bank of interest

data at the Center for Interest Measurement Research in Minneapolis to show that there are large sex differences in response to some items, such as "operating machinery," "decorating a room with flowers," and "repairing electrical wiring." These differences appeared between men and women from the early adolescent years to the adult years, between groups of adult men and women in the same occupations, and between groups of men and women in the same occupations in 1930 and in 1968. Sex differences in item response seem stable over age and time and they do not disappear when occupation is held constant. Johansson and Harmon (1972) examined responses to all the items common to the male and female forms of the SVIB with occupation held constant and found that an average of 42 percent of the items showed large sex differences. Within occupations, the percentage of items showing large sex differences varied from 30 to 58. The percentage of items exhibiting large sex differences when the men-in-general and women-in-general groups were compared was 44. These data, based on recently tested occupational criterion groups, indicate a substantial amount of difference in the way men and women respond to typical interest inventory items.

Separate item pools. Since there are documented sex differences in response to interest inventory items, the practice of providing a separate set of items for each sex should be examined. A recent review of the 1965 and 1972 editions of Buros' *Mental Measurements Yearbook* showed that eight inventories, or 16 percent of all the inventories listed in those years, have separate forms for males and females. Not all of them were inspected, but it seems clear that the only reason to provide separate forms is that the item pool differs for men and women. The underlying assumption seems to be that men and women play different occupational roles that cannot be described by one set of interest inventory items.

Where separate item pools exist, critics have cited the presence of items descriptive of high-level technical and business activities in the item pools for men and of domestic and clerical activities in the item pools for women. The SVIB forms T399 and TW398 have over half of their items in common; yet one of the issues that led to the development of the Strong-Campbell Interest Inventory, published in 1974, was the separate item pools. In a memo to the Strong Vocational Interest Blank Advisory Board regarding the need for an immediate revision of the Strong blanks, combining them into one form, Campbell wrote in January of 1972: "The SVIB does tend to perpetuate stereotypic roles for men or women, at the expense of women, both by the kinds of items included and the kind of information provided in the profile."

Since many reputable interest inventories have been able to develop effective scales without using separate item pools, it can be concluded that separate item pools are a source of sex bias in interest measurement in that they call attention to sex differences unnecessarily.

One of the important side effects of the separate item pools on a well-researched inventory like the SVIB is that they preclude easy comparison between the item responses of men and women. Even though half the items are identical, they are numbered differently in the two forms and appear on different scales, creating nearly prohibitive difficulties for anyone wanting to compare male and female responses. This author believes that systems are designed to accommodate projected needs. The fact that male-female comparisons across the Strong blanks are so difficult suggests that until now no one in over 40 years has considered them important.

Identical items pools for men and women are essential to avoid introducing sex bias and to facilitate research on sex differences in item responses. Where sex differences in item responses are found, it is necessary to explore their real impact on interest inventory scales before conclusions are drawn about the effect of sex differences in measuring interests.

Item content. Interest item content can imply the "correct" sexual identity of the respondent who endorses it. Few men would dare say they like the occupation "saleslady." Certainly items that include *man, woman, girl, boy,* or *lady* are sexually biased. Other items that do not explicitly involve a sexual stereotype nevertheless may

elicit stereotyped images and responses because of cultural bias. For example, the item "nurse" is probably perceived and responded to as a feminine occupation although the name of the occupation does not imply an "appropriate" sex.

There has been some controversy over the best type of item content for interest inventories. Strong (1943) built his inventories with several types of content such as occupational names, activities, school subjects, and personal characteristics. Holland (1965a) developed the Vocational Preference Inventory with items that are all occupational titles. He argued (1973) that occupational names stimulate reliable vocational stereotypes in the test taker. Campbell (1974) found that occupational titles as items separated occupational groups more effectively than items on the SVIB, which utilized other types of content in addition. Kuder (1970b) argues persuasively against the use of occupational titles.

Now we need to determine if sexual stereotyping of occupations is more closely related to one type of content than another. For instance, if an occupational name like "physician" is perceived as masculine while an activity like "watch open-heart surgery" is not, using items based on occupational activities may be a subtle way of combating the culturally induced sexual stereotyping each individual brings to the testing situation.

Item format. There has been considerable controversy about item format, or the way the item is presented (Campbell, 1974; Dolliver, 1968; Kuder, 1970b). The most popular formats include presenting one item and asking the respondent to endorse it or not and presenting two or three items and asking the respondent to choose between them or rank them. Both formats have been accused of reducing validity. If men and women respond to items formats differently, item format can contribute to bias. Strong (1943) presented evidence of minimal differences in response bias between men and women, but it is not clear whether they responded to the same items. The issue is complex and of lesser importance than some of the others, but it might be investigated.

ISSUES RELATED TO SCALE DEVELOPMENT

The task in developing scales for an interest inventory is to provide scores that will reflect the interests of an individual in a way that is useful in career planning. Obviously scales containing sexual bias cannot adequately fulfill this function. Given the fact that scales are built from items and items do differentiate between the sexes, it is important to explore the impact of these sex differences on the scales.

Scales based on external criteria. For interest inventories utilizing external criteria in scale development, the crucial issue is what the criteria should be. Usually the criterion is membership in some occupational group—by sex. There are, however, two subissues. First, there is the question whether it is useful to employ separate criterion groups of each sex where members of both sexes are readily available. Second, there is the question of what do do when members of only one sex are available for a criterion group.

Separate sex scales. The belief that men and women in the same occupation do different things has been expressed by Johnson (1970). Intuitively his assessment of the situation seems correct: male social workers become administrators and teachers, while female social workers see clients; male lawyers practice corporate law, while female lawyers practice social law. We do not know whether these arrangements of people within occupations are political or whether they are based on real sex differences in interests.

Both the SVIB and the Kuder OIS scales are based on separate criterion groups of males and females (even if two scales are required for one occupation). The implication is that sex differences are very important in occupations and in measuring interests. In a study by Johansson and Harmon (1972), where large numbers of items were found to differentiate between men and women in the same occupation, a further analysis was performed. The investigators found that a relatively small proportion of the items that differentiated between the sexes in an occupation actually appeared on the male or female SVIB scale for that occupation. Thus the

effect of sex differences in item response is not as great as it appears from the number of such items because they do not all appear on occupational scales. Johansson and Harmon concluded that it might be possible to build good scales by combining males and females in an occupation and comparing their item responses with those of a combined in-general or reference group. Since the Kuder OIS uses all the items on each scale (Zytowski, 1973), male-female item differences might have a greater effect on scales if criterion groups of people in the same occupation were combined.

Combined sex scales. Some preliminary work on building occupational scales based on both sexes is being done by the author and Pat Webber, of the Center for Interest Measurement Research. The new Strong-Campbell Interest Inventory has a common item pool, so the effect of male-female item differences on scales can be studied directly. Three tentative scales were developed: a scale utilizing the comparison between male veterinarians and a male reference group, one utilizing comparisons between female veterinarians and a female reference group, and one utilizing a comparison between a criterion group of male and female veterinarians weighted equally and a reference group of males and females weighted equally. Table 2 lists the items from the Occupations section (items 1-131) that appeared on each of the three tentative scales: 8 items appeared on all three scales, 20 items appeared on two scales (all 20 on the scale for combined sexes and 10 each on the male and female scales), 5 items appeared on the male scale only, 7 on the female scale only, and 1 on the combined scale only. These findings demonstrate that for veterinarians it is possible to develop an occupational scale for combined sexes that has an adequate number of items and will correlate adequately with both the single-sex scales. Appropriate validity studies have yet to be completed. Whether or not other occupational scales can be derived in the same way is not clear. Strong (1943) studied this problem by scoring men and women on scales for both sexes. He concluded that the men's and women's scales could be combined in some cases but not in others. Interestingly enough, he did not try it. More research is needed. If valid scales can be built using combined criterion and reference groups, this will mean not that the interests of males and females in an occupation are the same, but that sex is not an important enough source of variance to require a separate scale.

Weighting sexes in criterion groups. Another kind of problem arises in building occupational scales where there are only a few members of one sex employed in the occupation or available to be in the criterion group. The procedure used in scale building should minimize the effect of male-female differences in item response unless it can be demonstrated that they are important in building an effective scale. Although the idea of composing each criterion group of the same proportion of males and females as are found in the occupation makes some sense at first, further reflection shows that it is only a modification of the approach already in use. If 90 percent of an occupation is composed of males and that proportion is maintained in the criterion group, we would expect the scale to be more representative of men's interests than of women's.

Actually, it is not even that simple where the SVIB is involved. Since the method employed literally removes the interests common to one sex or the other from consideration (Dolliver, 1968), atypical interests for males may be typical interests for females and result in findings like those of Stanfiel (1970), who showed women obtained more high scores on the men's form of the SVIB than on the women's form. Campbell (1974) presented data showing that males score higher on many scales developed for females than on the scales developed for males in the same occupation, and that females scored higher on many scales developed for males than on the scales developed for females in the same occupation. It might be possible to apply a sort of correction factor if the differences were consistent across all occupations. Unfortunately, there is considerable variation in the amount of difference between men and women in scores on male and female occupational scales.

We can conclude that the best way to minimize sex bias is to weight males and females equally in criterion groups and reference groups

TABLE 2.—*Items appearing on three tentative SCII scales for veterinarians (items 1-131, Occupations)*

		Direction "Like" is scored—	Scales on which items appear		
			F (23%)	M (18%)	F&M (15%)
2	Advertising executive	−		X	X
10	Auctioneer	+		X	X
13	Author of technical books	+	X		X
19	Biologist	+	X	X	X
29	Church worker	+	X		
30	City or State employee	−	X	X	X
31	City planner	−		X	X
34	Computer operator	−		X	
41	Dentist	+		X	X
42	Designer, electronic equipment	−		X	
43	Dietitian	−		X	
46	Editor	−		X	
49	Elementary school teacher	−	X		X
50	Employment manager	−	X	X	X
52	Farmer	+	X	X	X
59	High school teacher	−	X		
60	Home economics teacher	−	X		X
70	Labor arbitrator	−		X	
71	Laboratory technician	+	X		X
78	Manager, child care center	−	X		X
79	Manager, women's style shop	−	X		X
85	Newspaper reporter	−		X	X
86	Nurse	+		X	X
88	Office clerk	−	X		
89	Office manager	−			X
92	Pharmacist	+		X	X
94	Physician	+	X	X	X
95	Playground director	−	X		
98	Politician	−		X	X
99	Private secretary	−	X		
104	Public relations director	−	X		X
105	Rancher	+	X	X	X
107	Receptionist	−	X		
109	Sales manager	−		X	X
111	Scientific illustrator	+	X		X
112	Scientific research worker	+	X		X
115	Social worker	−	X	X	X
121	Surgeon	+	X	X	X
127	Vocational counselor	−	X		X
130	X-ray technician	+		X	X
131	YMCA/YWCA staff member	−	X		
	Total		25	23	29

even if that is not the proportion which reflects the status of the occupation. Schlossberg and Goodman (1972) have indicated that there are enough people of the "opposite" sex in many occupations to provide adequate criterion groups of males and females in atypical occupations. Criterion groups are usually selected by finding some concentrated source of people committed to their occupation, such as a professional organization, union, or licensing board.

Scarcity of members of one sex in an occupation dictates a more extensive and more expensive search for criterion group members. Although the number of individuals needed in a criterion group varies in a way that is not predictable, 200 individuals is probably a reasonable minimum (Harmon, 1968). To provide a good criterion group with both sexes represented equally, it is probably necessary to have a minimum of 200 individuals of each sex. If this minimum is met, the item response percentage for each sex should be averaged.

One-sex scales. This procedure will not work where fewer than 200 persons of each sex are available, so the question whether to build scales on a single sex (and how to use the many that have already been built) arises. It seems unreasonable to build more scales based on one sex when they may contain sex bias. After equal opportunity has been in operation for a few decades, we may be able to determine if there are occupations that attract only members of one sex. Until then our efforts can be expended in building occupational scales based on criterion groups of both sexes.

Where scales have already been developed by using criterion groups of one sex, we should probably continue to use them for that sex until they can be converted into scales for both sexes. There has been considerable controversy about whether to use scales developed on one sex with the other. Darley and Hagenah (1955, p. 71) suggested using the men's form of the SVIB in conjunction with the women's form for women who have a "high degree of career motivation, maturity, and ability." Strong (1943, p. 576) was convinced that "it is much better to score a sex on its own scales." The Association for Measurement and Evaluation in Guidance Commission on Sex Bias in Measurement (1973) took the position that using "wrong" sex scales is psychometrically meaningless. The data from Stanfiel (1970) and Campbell (1974) suggest they are right.

Kuder (1970a) showed that there are respectable correlations (medians from .74 through .81) between women's scores on 13 sets of Kuder OIS scales for men and women in the same occupation. Although the levels of their scores on the male and female scales might "differ considerably," "scales that yield the highest scores in one set generally yield high scores in the other." Thus it appears that one can use "wrong" sex scales on the OIS if one explores the highest scores on those scales, comparing their content but not their level with that of the highest scores on the correct sex scales. Without additional study, this procedure cannot be generalized for inventories with scales that were not developed as the OIS scales were. It would seem more fruitful to exert the same effort in developing new scales where scales based on one sex are the only ones available.

Note that there is seldom a problem in testing men with occupational scales developed on criterion groups of women. The scales available for women but not for men do not represent the most prestigious or highly paid occupations in our society, which may explain why men are not strongly motivated to use them. Alternatively, the cultural prohibitions against men being interested in "women's" occupations may be much stronger than cultural prohibitions against women being interested in "men's" occupations.

Criterion group stability over time. Since collecting criterion groups is expensive, it is reasonable to ask whether, once collected, scales based on them can be appropriately used over long periods of time. Campbell (1971, ch. 9) presented four different kinds of evidence that the people in various occupations do not differ much over 30 years in their measured interests. Only one of the studies involved women subjects. However, the evidence strongly suggested that people in occupations have a common set of interests that do not change much over time. This finding probably applies equally to men and women.

General changes in the popularity of SVIB items over time have been documented for women by Hill and Campbell (1969) and for men by Campbell (1968). Since interests of those in occupations are more stable, these findings apply more directly to the composition of reference or in-general groups. If reference groups are to be used, the problem of cultural change in item response must be investigated further. Unfortunately, studies of differential rates and types

of cultural change between men and women have not been done, as they require longitudinal data and a common item pool for men and women. Apparently, researchers on the Kuder inventories are in a position to provide this information earlier than any other researchers.

The foregoing discussion leaves unresolved the question of what to do if there is only an occupational scale for the "wrong" sex or no scale at all available where counseling is needed. The availability of occupational scales can be a source of sex bias, in that one can be discouraged from considering a career or a whole set of careers by the absence of an appropriate interest inventory scale. The only solution to this problem in both the long and the short range lies in the use of homogeneous scales based on internal criteria, since occupational scale building will always lag behind changes in the world of work.

Scales based on internal criteria. Homogeneous scales appear on the Strong Vocational Interest Blank and the Minnesota Vocational Interest Inventory, which also have scales based on external criteria, as well as on dozens of interest inventories that have homogeneous scales exclusively. The set of homogeneous scales available on a given inventory suggests a model of the organization of vocational interests.

Many researchers have addressed the question of the factorial structure of interests. Two of the earliest studies, by Thurstone (1931) and Crissey and Daniel (1939), found somewhat different factors for men and women. Both studies found "science," "language," and "people" factors, but Thurstone found a "business" factor for men and Crissey and Daniel found an "interest in male association" factor for women. Scales that contributed to the latter included those of housewife, office worker, stenographer, and nurse.

More recently, factor studies have concentrated primarily on the structure of men's interests as reviewed by Super and Crites (1962). So have attempts to understand the conflicting information that sometimes arises from the use of two inventories (King, Norell, & Powers, 1963; Kuder, 1969; O'Shea & Harrington, 1971; O'Shea, Lynch, & Harrington, 1972; Zytowski, 1968, 1972).

The most promising material on the structure of interests is that of Holland (Holland, Whitney, Cole, & Richards, 1969) and Cole (Cole, 1973; Cole & Cole, 1970; Cole & Hanson, 1971; Cole, Whitney, & Holland, 1971) in which a structure is proposed, a methodology is established, and applications of the structure to occupations, to men's interests, and to women's interests are substantiated. The results show that there is an interest structure common to men and women that corresponds to the circular two-dimensional arrangement of interests proposed by Roe (1956) and Holland et al. (1969). Both inventories based on internal criteria and inventories based on external criteria were included in Cole's analyses.

Cole (1973) suggested an extremely valuable method of surmounting the problems of sex bias inherent in using sets of externally referenced scales that include no scales for occupations women do not traditionally enter: use the available scales from these inventories to locate the individual's interests in the circular structure and to generalize from that position to the full range of occupations that occupy nearby positions in the structure. Homogeneous scales on the Vocational Preference Inventory (Holland, 1965a), ACT's Vocational Interest Profile (1972), and the new Theme scales on the Strong-Campbell Interest Inventory (Campbell, 1974) correspond directly to the structure and can be used to locate individuals' interests in the structure.

The process does rest on an important assumption that should be investigated. Since the occupational locations in the structure are based on the vocational preferences of young people, not employed adults, the method does not possess any demonstrated predictive validity. The work of Campbell and Holland (1972) and Hansen and Johansson (1972) established concurrent validity for scales related to Holland's model (1966, 1973), which corresponds to Cole's structure, by showing that they separate occupational groups. Like most homogeneous scales, they do not differentiate as well between occupational criterion groups as do occupational scales. However, there are enough data on the construct validity of Holland's formulation

(Holland, 1973, ch. 5) to suggest that more evidence of predictive validity will be forthcoming. At the present time Cole's method for using interest inventories appears to be the best way to proceed, but predictive validity must be established.

In general, homogeneous scales have not been shown to have much predictive validity. Zytowski (1974) reviewed studies that have attempted to establish predictive validity for homogeneous scales. He conducted a study of the Kuder Preference Record, utilizing two methods. His conclusions were that the Kuder Form B was predictive of future employment but not accurate enough to use in individual counseling. His subjects were men, but his study illustrates the point that the type of instrument that has the least potential for sex bias because of common item pools and common scales for both sexes has the least predictive validity (Harmon, 1973).

ISSUES RELATED TO NORMS

Norms for interest scales with external criteria are usually implied by those criteria. If the criterion group is made up of persons of one sex, so is the norm group. The same issues about the appropriateness of this procedure arise in discussing both norms and scale construction. The inappropriateness of scoring individuals on scales developed on the "wrong" sex was discussed earlier. The only way to insure that the norms on interest inventories based on external criteria are not sexually biased is to make sure that the scales are not sexually biased.

Norms for homogeneous scales based on internal criteria are usually developed by scoring a group of people within some age range on the scales. Most homogeneous scales, such as those on the Vocational Preference Inventory, the Kuder Form C, the Ohio Vocational Interest Survey, and the Strong Vocational Interest Blanks, have separate norms for men and women. Norms do not confer validity; they are used as a basis for meaningful comparison of individuals with a group. In the case of interest inventories these comparisons are used as a basis for discussion about future plans. D'Costa (1972) and Goldman (1972a) have advocated that interest inventory results be used as aids in discussion and vocational exploration. As soon as they are used predictively, however, the norms become very important. We know that it is psychometrically defensible to provide separate norms when the scores for two groups (for instance, male and female) differ appreciably, but the practical meaning of sex-segregated norms is obscure. For instance, if a high school senior woman scores high on a homogeneous scale for machine work compared with other high school senior women, how should she interpret this information? One might guess that she would score lower on norms for high school senior men. But on the Ohio Vocational Interest Survey report form (where a Machine Work scale appears) the male norms are not available to her. Should she be encouraged to consider machine work because she scores high compared with her same-sex peers, encouraged not to consider machine work because she scores high compared with her same-sex peers, encouraged not to consider machine work because she *probably* scores lower than her opposite-sex peers, or encouraged to consider her interest in machine work on the basis of a comparison with people who do and like machine work? (In the latter case, the available norms for high school students offer her no information at all.)

The problem is that general sex norms for homogeneous scales confer no criterion-related validity, but we tend to use them as though they did. It would probably be better to report scores on homogeneous scales simply as a code type, as in Holland's Self-Directed Search (1965b), encouraging individuals to explore their strongest interests and avoid comparisons with other people completely. If results of homogeneous scales are to be used predictively, the scores should be validated. Concurrent validity could be established by collecting norm groups of employed workers in various occupations, as with externally developed scales. However, the question of how the sexes should be represented in such norm groups—whether equally, proportionately, or separately—is unresolved, and only further study will resolve it. This is certain to be an expensive and difficult task.

Although Cole (1973) developed her structure of women's interests by utilizing scales developed or normed for women only, the author feels strongly that it would be more fruitful to explore the predictive validity of her suggested procedure than to collect more occupational norm groups for homogeneous scales. This type of research should be possible at both the American College Testing Program and the Center for Interest Measurement Research. Both have a large, mature bank of data on individuals, in the sense that the data are old enough to support meaningful longitudinal studies. The eventual occupations of students who took the Vocational Interest Profile at ACT can be ascertained. At the Center for Interest Measurement Research the task is even easier, since older Strong Vocational Interest Blanks for people whose eventual occupations are known can be scored with the scales based on Holland's theory (Campbell & Holland, 1972; Hansen & Johansson, 1972).

If the use of homogeneous scales normed for women and the occupational structure presented by Cole are predictively valid, they should be used. The use of code types to locate an individual in the occupational structure without further reference to norms also should be explored. If these procedures do not prove to be predictively valid, we will have to norm homogeneous scales on employed groups in an attempt to establish concurrent validity.

Although a discussion of validity seems out of place in a discussion of norms, it is clear that norms on interest inventories have no purpose at all if they are unrelated to validity.

The discussion of norms brings up the question of how age is related to criterion groups and norm groups. Campbell (1971, ch. 5) has demonstrated that there are a number of SVIB items that differentiate between men of various ages. He used them to develop an Age Related scale. He was also able to identify scales where scores increased or decreased with age in a large, fairly representative sample of men. Apparently, even though individual SVIB scores are quite stable over time (Campbell, 1966a, 1969), there are group differences in item response and scale scores over time.

Since women, at least at this time, probably utilize vocational counseling on a different schedule than men, the effects of these differences may be important. Astin and Myint (1971) and Harmon (1970) have shown that career women are difficult to distinguish from noncareer women until the woman is an adult, after the time when the information is traditionally needed for career planning. Many women do seek career counseling as adults with grown children, rather than as late adolescents.

It is appropriate to ask whether interest inventories provide adequate measures of interest for "returning" women. The question of appropriate norm groups and occupational groups for older women is crucial.

Given the data presented by Campbell, it would appear to be best to have norm groups or criterion groups composed of a wide range of ages. This is usually the case in inventories based on external criteria, since occupational status is more important than age. On inventories based on internal criteria, age as well as sex norms are often used. Few of them have adequate adult norms, high school and college norms being much more typical. Homogeneous scales can be used with returning women to establish an individualized order of preference among vocational dimensions without reference to norms. This preference may be more useful than comparisons, which are potentially affected by age differences. These issues should be considered in developing interest scales to be used with women because of the different life patterns they are likely to follow.

INTERPRETIVE PRACTICES

These are obviously complex issues that it is important for the counselor to understand. Some of the problems can be alleviated by choosing the most appropriate inventory for each individual. If the client is a 14-year-old girl the problem is quite different from what it would be for a 50-year-old woman, and it would seldom be appropriate to select the same interest inventory for both.

There are some general rules that apply in this case. It is important to select an inventory

with an unbiased item pool. The counselor should not reinforce sex stereotyping by presenting the client with test materials that appear to divide the world of work into two classes—male and female. The report of scores or interest profiles should not contribute to sex stereotyping either, but report forms for most of the major inventories are currently unable to meet this condition. They contain either separate scales or separate norms for each sex. Since there almost certainly are complex influences at work to make the use of "wrong" sex scales and norms questionable and we are not sure at this time whether separate norms and separate scales are necessary, how to present interest inventory scores is a problem.

It seems silly for psychologists to have to admit to clients that our professional eyesight has been afflicted by a form of double imagery (seeing the world of work as a sexual dichotomy), which has resulted in a set of psychological instruments that we now realize (being on our way to better eyesight) are largely uninterpretable. The best proposal before us seems to be to use the available instruments to assign women clients to a position in Cole's (1973) structural model (which approximates Holland, Whitney, Cole, & Richards' theoretical hexagon). This procedure will require that the practicing counselor keep a close eye on the research literature of vocational interest measurement. If some evidence of the predictive validity of this approach does not appear within the next five years, the approach should be abandoned.

TWO PSYCHOMETRIC FANTASIES

Suppose that in seeking the origins of interest measurement we are led back to a group of men and women who were not operating under the assumption that some jobs are men's jobs and other jobs are women's. They would have devised a pool of items to differentiate between people in various occupations and people in a general reference group, or to differentiate people with high interest in one interest factor or cluster from people with high interest in another. Certainly this idea could have occurred in the 1920's, when the early feminists had scored a major victory and earned the vote. If sex had been an important variable in measuring interests in various occupations or interest factors, the researchers would have found out early. If they had started with the assumption that all work is available to all people, they would not have relegated to unimportance the problem of how to treat real sex differences. Instead, they would have worked to insure that sex differences entered the measurement process only where they were really appropriate and had something to contribute toward helping individuals learn about their interests and how those interests relate to jobs. But this fantasy is too idealistic; one cannot change the past.

One can influence the future, so it may be more productive to fantasize in that direction. If I were given an unlimited grant today to build a new interest inventory that would minimize sex bias, how would I proceed?

ITEMS

Obviously, I would avoid items that imply an "appropriate" sex. I would attempt to determine whether items containing occupational names or those containing occupational activities elicit more responses based on sex stereotypes. Data being analyzed now may help answer this question. Conroe (1974) asked 50 male and 50 female college students to respond to the Strong-Campbell Interest Inventory in a "typically masculine" and "typically feminine" manner. Since the SCII contains both types of item content, it will be possible to study the responses for each condition to ascertain which class (names or activities) elicits the largest differences between them. Actually, the data will allow for comparisons between all the types of content on the SCII.

Since I know that some items are more highly endorsed by men than by women, I would want to balance the number of each type in my inventory (AMEG, 1973). This would avoid the appearance of bias toward one sex or the other and contribute to face validity for both sexes. It would also insure that a preponderance of items more highly endorsed by one sex or the other on any scale could not be attributed to the base

rates or number of such items available in the item pool.

SCALES

Since there is no clear answer to whether scales based on external or those based on internal criteria are better, I would build both types. First, I would administer my items to a large, randomly selected group of adults and identify interest factors or clusters. I would expect that factors similar to the types proposed by Holland (1966) would appear. It is clear from Holland's review (1973) that many researchers are finding that both interest and occupational data fit his model.

Then I would build some occupational scales. I would attempt to select occupations for study that (1) are least likely to imply sexual stereotyping when their names appear on a profile or report form, (2) are representative of major areas of interest, and (3) are representative of major levels of occupations. Diamond (1971) has shown that sex differences are more important at low occupational levels than at higher occupational levels. I would avoid occupational groups with extreme splits in sexual composition. If a group has less than 20 percent of one sex or the other, I would avoid building a scale for it.

My rationale is both psychometric and political. Building scales for one-sex occupations introduces problems of sex bias in scales and norms. A scale for "able-bodied seamen" based on a sample of 200 men in the occupation is more likely to include or weight heavily a number of items that differentiate men from women than such a scale based on 200 women and 200 men. This problem might be solved if one had 400 men and 100 women by weighting the responses of each sex equally, but why build a scale for an occupation that is essentially a "male" occupation? The answer is to encourage more women to enter it. Analogously, we should build scales for occupations such as child care worker to encourage more men to enter them. This argument illustrates how the psychometric and political aspects of the problem interact in decisionmaking. This phenomenon has no doubt been at work in interest measurement technology for years without anyone taking particular notice of it.

A general reference group for use in selecting items might be derived from the general population group used in developing homogeneous scales. Both Strong (1943) and Campbell (1971) have described problems of formulating a general reference group. Occupational level and culture as related to year of testing have been shown to affect the reference group. Thus the best reference group for selecting or weighting items on the occupational scales would become a subject for investigation.

RELIABILITY

The scales developed must measure reliably over time if they are to be put into use. Appropriate reliability studies would be done, since it has been demonstrated that interests can be measured reliably for both men and women (Campbell, 1966a, 1969). I would anticipate no problems in this area.

NORMS

I would provide general population norms for the homogeneous scales. At least high school, college-age, and adult norms would be needed. The procedure used in item selection should minimize sex differences on these scales, but whether or not they would eliminate them is a question the data must answer. My guess is that I would still find women scoring somewhat higher on the social or some corresponding scale and men scoring higher on the mechanical or a corresponding scale.

Whatever my findings, I would build a periodic norming procedure into my organizational and fiscal structure. Too many test developers provide new norms only after it is clear that the old ones are outmoded or inadequate. Realistically, this practice is understandable, but it contributes to poor testing practice. Ethically, it seems wiser to build the cost of up-to-date norms into the charge for the test, because these are an important service to the user.

For the occupational scales, I would provide occupational norms. The evidence suggests less change over time within occupational groups than within total population, so I would be less concerned about renorming these scales.

VALIDITY

The occupational scales would presumably have concurrent validity because they were developed by using occupational groups. Tilton's overlap (1937) would be computed between each occupational group and the general reference group to establish the concurrent validity of the occupational scales. Concurrent validity for the homogeneous scales, which would hopefully be related to Holland's types, could be established by scoring the occupational samples on them. The high scores of each occupational group would be expected to correspond to those listed for the occupation in Holland's Occupations Finder (1970).

A major concern would be whether the developed scales would predict occupational behavior. The only way to examine future behavior, assuming that the items selected for the scales had never been used together before, is to do a large-scale longitudinal study. Ideally, the subjects originally studied would be of various ages, not just college freshmen. On followup, the predictive power of both types of scales, homogeneous and occupational, would be assessed by age at first testing and by sex. The basic data might take the form suggested by figure 1. Hit rates, or proportions of correct predictions, would be calculated. Two sets of decision rules would be necessary—one for determining how individuals would be placed in each predictive category and one for determining what kind of

Scale	Number of predictions by age group at testing	Percentage of hits		
		Male	Female	Total
Social (homogeneous)	High school:			
	College:			
	Adult:			
	Total:			
Social (occupational)	High school:			
	College:			
	Adult			
	Total:			
Investigative (homogeneous)	High school:			
	College:			
	Adult:			
	Total:			
Investigative (occupational)	High school:			
	College:			
	Adult:			
	Total:			
etc.				

FIGURE 1.—Suggested form for presenting predictive validity of interest scales established by hit rates.

vocational behavior would be declared a correct prediction. Individuals could be placed in predictive categories on the basis of their highest scores, on the basis of scoring high on a scale compared with the general population, or on the basis of scoring high on a scale compared with people in a relevant occupation. Actually, calculating hit rates by using various sets of decision rules for making predictions would also provide valuable information about the various interpretive strategies.

Decision rules for assessing hits based on homogeneous scales might be based on predictions derived from either Holland's Occupations Finder or Cole's structural model as criteria, although a failure to find a high proportion of hits in this case might be interpreted as a lack of validity in either the predictor scales or the criteria, or both. It appears to be much easier to assign a hit or correct prediction when occupational scales are used because it is easy to tell whether or not the individual is in the occupation named by the scale. However, hits have usually been attributed to occupational scales when an individual entered the occupation named by the scale or a closely related occupation (Campbell, 1966b; Harmon, 1969).

One problem that must be addressed in assessing the predictive validity of interest inventories for women is that not all women work. The number and proportion of working women are increasing (U.S. Department of Labor, 1969), but Kriger's recent research (1972) suggested that the basic career decision made by women is whether or not to work. Perhaps my interest inventory should have a scale to predict orientation toward or away from career commitment for both women and men. Schissel (1968) built such a scale for women by using the Strong Vocational Interest Blank for Men. If a career-orientation scale were available, "nonworking" could be a predicted criterion. However, until the care of young children is shared equally by males and females in our society, there will probably be many young women with high career aspirations at home caring for children.

Harmon (1969) employed a strategy for assessing predictive validity that removed noncareer women from consideration and gave career women who were temporarily out of the job market credit for their career commitment. In the proposed followup the same latitude could be extended in assigning men to criterion categories.

A related problem is that many women enter occupations out of convenience or need. A large proportion of families with incomes below the poverty level are headed by women (U.S. Department of Labor, 1969). Few of them, with families to care for, can pay much attention to their interests or to long-range planning. Circumstances like these also befall men, but they seem more common for women. If they are in fact more common for women, we would expect a longitudinal followup of the predictive accuracy of an interest inventory to show better prediction for men than for women. Thus, if society offers a wider range of choices to one sex than the other, we might expect better prediction of job criteria from interests for that sex—unless, of course, there is an interaction between the opportunities society offers and the development of interests. Both Roe (1956) and Holland (1973) suggest that there is such an interaction. To explore cultural change and its interaction with interests, our followup studies, as well as norming efforts, would have to be put on a schedule. Actually, they might go hand in hand, with new norm groups tested every 5 years and followed up 10, 15, and 20 years later.

INTERPRETATION

Remembering that this fantasy is predicated on unlimited funds, I would do some unusual things to insure that the interest inventory I had developed would be well used. I would substantially discount the cost of materials and scoring to all qualified users who attended regular workshops on its use or passed periodic examinations showing that they understood vocational-interest technology in general and new developments in particular. Goldman (1972a, 1972b) has so despaired of the counselor's competency in using tests that he has advocated that counselors stop using them. I would attempt to educate counselors instead.

Interpretive materials available for clients would stress the interaction between culture

and testing. They would point out the necessity for renorming and the possibility that people in general might change over the next five years. For homogeneous and occupational scales, they would clearly present what validity data are now available and what data we need in the future if we are to be more certain about our predictions. They would give the client enough information about what is and is not known to make a decision as to how much weight to place on the scores. This procedure would be difficult to implement, but it would put the responsibility where it belongs—on the client. The counselor whose needs are met by knowing more than the client and grandly unraveling the mystery before the client's eyes would not be very comfortable with either the ambiguity of these materials or their appeal to the client to act as his or her own counselor.

EPILOG TO THE FANTASY

All this ambiguity makes me quite uncomfortable too. None of the elements of my fantasy are new or unusually creative, but I am impatient because the answers are not yet available. We do not know the effect of balancing items in an interest item pool according to sex-based differences in item responses. We do not know the effect of developing occupational scales with criterion groups of men and women equally weighted. We do not know whether Cole's method of locating clients in a structural model has predictive validity. We do not know much about how interests develop and change. While the ambiguities make me intellectually uncomfortable, I am even more uncomfortable with my clients.

None of the measurement procedures available to me provide me with both a lack of sex bias and good predictive validity. Apparently I will have to live out my own fantasy and be absolutely honest with my clients about potential sex bias in items, scales, and norms in the interest inventories I ask them to complete, and about the uncertain validities associated with using "wrong" sex scales or with using Cole's structural model.

When a fantasy is shared, what is the expected result? Approval, argument, or attention? This author will settle for action. I am not as much concerned that we settle the questions I have raised in the direction I have predicted as that we investigate whether our view of the world of work as dichotomized by sex is really necessary in interest measurement. This basic question must be answered before we know how to define sex bias in interest measurement more clearly and eliminate it more surely. To that end the following guidelines are dedicated.

GUIDELINES

In summary, the following guidelines can serve as both a means of assessing current interest inventories for sex bias and a plan of action for developing new interest inventories that are free of bias.

1. The content of interest inventory items should not imply that any occupation or activity is more appropriate for one sex than the other.

2. The pool of interest inventory items that make up an interest inventory should be appropriate for both sexes and used for both sexes.

3. Because there are sex-based differences in item responses, the item pool should contain equal numbers of items more highly endorsed by men than women and items more highly endorsed by women than men.

4. Groups used in developing scales should be composed of men and women in equal proportions or the effects of the two sexes should be statistically equalized.

5. Scores on the same scales should be available for both men and women (not just scores on scales that have the same names but use different items).

6. Norms on homogeneous interest scales should not be presented by age or sex without evidence about the predictive value of a "high" score as related to such norm groups.

7. Groups used to obtain norms for occupational scales should consist of men and women in equal proportions or the effects of the two sexes should be statistically equalized.

8. Publishers of interest inventories should have a preannounced plan of periodically renorming homogeneous scales.

9. Publishers of interest inventories should have a preannounced plan for periodic studies of the predictive validities of both homogeneous and occupational interest scales.

10. Published interpretive materials should indicate clearly that sex norms for homogeneous scales do not imply anything about the predictive validity of the scales and should encourage clients to evaluate their scores in relation to both sexes.

11. Published interpretive materials should indicate clearly that using occupational scales developed for one sex with the other sex is of questionable validity because the underlying technology tends to maximize sex differences unduly.

12. Publishers of interest inventories that do not meet these guidelines should show evidence that attempts are being made to define, study, and eliminate sources of sex bias in their instruments.

REFERENCES

American College Testing Program. *Handbook for the ACT Career Planning Program.* Iowa City: Author, 1972.

Association for Measurement and Evaluation in Guidance. AMEG commission report on sex bias in interest measurement. *Measurement and Evaluation in Guidance,* 1973, 6, 171-177.

Astin, H. S., & Myint, T. Career development of young women during the post high school years. *Journal of Counseling Psychology,* 1971, 18, 369-393.

Bird, C. *Born female.* New York: McKay, 1968.

Buros, O.K. (Ed.). *The Sixth Mental Measurements Yearbook.* Highland Park, N.J.: Gryphon Press, 1965.

Buros, O. K. (Ed.). *The Seventh Mental Measurements Yearbook.* Highland Park, N.J.: Gryphon Press, 1972.

Campbell, D. P. *Manual for the Strong Vocational Interest Blanks.* (Revised from E. K. Strong, Jr.) Stanford, Calif.: Stanford University Press, 1966. (a)

Campbell, D. P. Occupations ten years later of high school seniors with high scores on the SVIB Life Insurance Salesman scale. *Journal of Applied Psychology,* 1966, 50, 369-372. (b)

Campbell, D. P. Changing patterns of interests within the American society. *Measurement of Evaluation in Guidance,* 1968, 1, 36-49.

Campbell, D. P. *1969 Supplement to the Strong Vocational Interest Blanks Manual.* Stanford, Calif.: Stanford University Press, 1969.

Campbell, D. P. *Handbook for the Strong Vocational Interest Blank.* Stanford, Calif.: Stanford University Press, 1971.

Campbell, D. P. *Strong Vocational Interest Blank: Manual for the Strong-Campbell Interest Inventory.* Stanford, Calif.: Stanford University Press, 1974.

Campbell, D. P., & Holland, J. L. A merger in vocational interest research: Applying Holland's theory to Strong's data. *Journal of Vocational Behavior,* 1972, 2, 353-376.

Cole, N. S. On measuring the vocational interests of women. *Journal of Counseling Psychology,* 1973, 20, 105-112.

Cole, N. S., & Cole, J. W. *An analysis of spatial configuration and its application to research in higher education.* (ACT Research Report No. 35) Iowa City: American College Testing Program, 1970.

Cole, N. S., & Hanson, G. R. An analysis of the structure of vocational interests. *Journal of Counseling Psychology,* 1971, 18, 478-486.

Cole, N. S., Whitney, D. R., & Holland, J. L. A spatial configuration of occupations. *Journal of Vocational Behavior,* 1971, 1, 1-9.

Conroe, F. L. The effects of sexual role-playing on responses to the Strong-Campbell Interest Inventory. Unpublished master's thesis, University of Wisconsin—Milwaukee, 1974.

Crissey, W. J. E., & Daniel, W. J. Vocational interest factors in women. *Journal of Applied Psychology,* 1939, 23, 488-494.

Darley, J. G., & Hagenah, T. *Vocational interest measurement.* Minneapolis: University of Minnesota Press, 1955.

D'Costa, A. G. OVIS: A non-predicting device. *Measurement and Evaluation in Guidance,* 1972, 5, 411-419.

Diamond, E. E. Occupational interests: Male-female or high-level/low-level dichotomy? *Journal of Vocational Behavior,* 1971, 1, 305-315.

Dolliver, R. H. Likes, dislikes, and SVIB scoring. *Measurement and Evaluation in Guidance,* 1968, 1, 73-80.

Firestone, S. *The dialectic of sex: The case for feminist revolution.* New York: Morrow, 1970.

Goldman, L. Tests and counseling: The marriage that failed. *Measurement and Evaluation in Guidance,* 1972, 4, 313-320. (a)

Goldman, L. It's time to put up or shut up. *Measurement and Evaluation in Guidance.* 1972, 5, 420-423. (b)

Hansen, J. C., & Johansson, C. B. The application of Holland's vocational model to the Strong Vocational Interest Blank for Women. *Journal of Vocational Behavior,* 1972, 2, 479-493.

Harmon, L. W. Optimum criterion group size in interest measurement. *Measurement and Evaluation in Guidance,* 1968, 1, 65-72.

Harmon, L. W. The predictive power over 10 years of measured social service and scientific interests among college women. *Journal of Applied Psychology,* 1969, 53, 193-198.

Harmon, L. W. The anatomy of career commitment in women. *Journal of Counseling Psychology,* 1970, 17, 77-80.

Harmon, L. W. Sexual bias in interest measurement. *Measurement and Evaluation in Guidance*, 1973, 5, 496-501.

Hill, D. S., & Campbell, D. P. The changing interests of women. Unpublished paper read at Midwestern Psychological Association convention, Chicago, May 1969.

Holland, J. L. *Manual for the Vocational Preference Inventory*. Palo Alto, Calif.: Consulting Psychologists Press, 1965. (a)

Holland, J. L. *The Self-Directed Search*. Palo Alto, Calif.: Consulting Psychologists Press, 1965. (b)

Holland, J. L. *The psychology of vocational choice*. Waltham, Mass.: Ginn/Blaisdell, 1966.

Holland, J. L. *Making vocational choices: A theory of careers*. Englewood Cliffs, N.J.: Prentice-Hall, 1973.

Holland, J. L. Whitney, D. R., Cole, N. S., & Richards, J. M., Jr. *An empirical occupational classification derived from a theory of personality and intended for practice and research*. (ACT Research Report No. 29) Iowa City: American College Testing Program, 1969.

Johansson, C. B., & Harmon, L. W. The Strong Vocational Interest Blank: One form or two? *Journal of Counseling Psychology*, 1972, 19, 404-410.

Johnson, R. W. The use of interest inventories with women. *University of Wisconsin Counseling Center Reports*, 1970, 3(13).

King, P. T., Norell, G., & Powers, P. Relationships between twin scales on the SVIB and the Kuder. *Journal of Counseling Psychology*, 1963, 10, 395-401.

Kriger, S. F. Need achievement and perceived parental child-rearing attitudes of career women and homemakers. *Journal of Vocational Behavior*, 1972, 2, 419-432.

Kuder, G. F. A note on the comparability of occupational scores from different interest inventories. *Measurement and Evaluation in Guidance*, 1969, 2, 94-100.

Kuder, G. F. *General Manual, Kuder Occupational Interest Survey, Form DD*. Chicago: Science Research Associates, 1970. (a)

Kuder, G. F. Some principles of interest measurement. *Educational and Psychological Measurement*, 1970, 30, 205-226. (b)

Lewis, E. C. *Developing women's potential*. Ames: Iowa State University Press, 1968.

Millett, Kate. *Sexual Politics*. New York: Doubleday, 1969.

O'Shea, A. J., & Harrington, T. F. Using the Strong Vocational Interest Blank and the Kuder Occupational Interest Survey, Form DD, with the same clients. *Journal of Counseling Psychology*, 1971, 18, 44-50.

O'Shea, A. J., Lynch, M. D., & Harrington, T. F. A reply to Kuder's criticism of SVIB-KOIS comparative studies. *Measurement and Evaluation in Guidance*, 1972, 5, 306-309.

Parsons, T. *Social structure and personality*. London: Free Press, Collier-Macmillan, 1965.

Roe, A. *The psychology of occupations*. New York: Wiley, 1956.

Schissel, R. F. Development of a career orientation scale for women. *Journal of Counseling Psychology*, 1968, 15, 257-262.

Schlossberg, N. K., & Goodman, J. Imperative for change: Counselor use of the Strong Vocational Interest Blanks. *Impact*, 1972, 2, 25-29.

Stanfiel, J. D. Administration of the SVIB men's form to women counselees. *Vocational Guidance Quarterly*, 1970, 19, 22-27.

Strong, E. K., Jr. *The vocational interests of men and women*. Stanford, Calif.: Stanford University Press, 1943.

Strong, E. K., Jr. Good and poor interest items. *Journal of lege*. Minneapolis: University of Minnesota Press, 1955.

Strong, E. K., Jr. Good and poor interest items, *Journal of Applied Psychology*, 1962, 46, 269-275.

Super, D. E., and Crites, J. O. *Appraising vocational fitness*. (Rev. ed.) New York: Harper & Row, 1962.

Thurstone, L. L. A multiple factor analysis of vocational interests. *Personnel Journal*, 1931, 10, 198-205.

Tilton, J. W. Measurement of overlapping. *Journal of Educational Psychology*, 1937, 28, 656-662.

U.S. Department of Labor. *1969 Handbook on Women Workers*. (Women's Bureau Bulletin No. 294) Washington: Government Printing Office, 1969.

Women on Words and Images. *Dick and Jane as victims*. Princeton, N.J.: Author, 1972.

Zytowski, D. G. Relationships of equivalent scales on three interest inventories. *Personnel and Guidance Journal*, 1968, 47, 44-49.

Zytowski, D. G. A test of criterion group sampling errors in two comparable interest inventories. *Measurement and Evaluation in Guidance*, 1969, 2, 37-40.

Zytowski, D. G. A concurrent test for accuracy of classification for the Strong Vocational Interest Blank and Kuder Occupational Interest Survey. *Journal of Vocational Behavior*, 1972, 2, 245-250.

Zytowski, D. G. The Kuder Occupational Interest Survey. In D. G. Zytowski (Ed.), *Contemporary Approaches to Interest Measurement*. Minneapolis: University of Minnesota Press, 1973.

Zytowski, D. G. The predictive validity of the Kuder Preference Record over a 25-year span. *Measurement and Evaluation in Guidance*, 1974, 7, 122-129.

Technical Aspects: Problems of Scale Development, Norms, Item Differences by Sex, and the Rate of Change in Occupational Group Characteristics — II /4

Charles B. Johansson
NATIONAL COMPUTER SYSTEMS

ACKNOWLEDGMENT

The author is deeply indebted to David P. Campbell, director of the Center for Interest Measurement Research, University of Minnesota, for much of the empirical drta contained in this report.

C. B. J.

ABSTRACT

In the beginning of interest measurement there was little but conjecture. Then interest inventories were created to measure vocational preferences. Females and males were perceived as unique and were treated separately in analyses.

After nearly a half century of research, the following conclusions seem to be more true than false:

1. When males and females are asked to respond to different sets of items for the same inventory, sex biasing may be assumed by some without support of any data.
2. Men do not like to "decorate a room with flowers" as much as women do. Females do not like to "travel alone" as much as males do.

3. If there are separate tests or report forms for males and females, incorrect color coding may detract from the test's validity.

4. Differences between the sexes in item responses are established fairly early in life. By the eighth grade these differences are apparent.

5. Data show that there was no lessening of male-female item response differences from the early 1930's through the late 1960's. No data are available to show that there was any lessening of these differences from the late 1960's through the early 1970's.

6. Item response differences manifest themselves during construction of interest scales for the inventory.

7. Females and males differ in the magnitude of their interests on some vocational scales, such as social and realistic. These differences may be masked by statistical techniques before the reporting of results, or they may be pointed out by the use of separate norms.

8. The masking of sex differences in reporting scores may channel more people into nontraditional vocations than normally would occur if these differences were not masked.

9. Data are not available to indicate what the impact of masking sex differences will be on people who are channeled into seeking employment in nontraditional roles.

10. Interest inventories are only a very small part of the total area of potential bias in employment situations.

In summary, just as there is no single index of validity, there is no single method for eliminating potential sex biasing—some methods are more appropriate than others, depending on the inventory.

INTRODUCTION

As part of the larger concern over various types of discrimination and bias in the occupational world, the impact that interest inventories have in guiding people into careers and vocations is being studied. For some people the choice of a vocation may be a moot question. For example, the offspring who has known from childhood that he or she will become heir to the family business may have little choice in a career decision; and for the person who is in the right place at the right time, opportunities may open up that no interest inventory could predict when that person is trying to decide on a lifetime career.

But for the majority of people, deciding what field of work to enter is perhaps as important as deciding whom to marry; both decisions have considerable impact on their lives. Professionally trained counselors continually help people who are dissatisfied with their current jobs and desire a change to something more personally rewarding. Students who are graduating from high school are typically indecisive about what curriculum they should enter in college or in a business/technical school, and they therefore seek guidance. In addition, more and more women are entering—or reentering—the occupational world and college, and they seek professional help in their pursuit of career opportunities.

To help counselors in their role of providing career-planning assistance for their clients, interest inventories have been relied on for data on clients' vocational interest preferences and for help in increasing the probability that a chosen career or job will be a satisfying one.

Typically, the major interest inventories have separated responses of males and females during the developmental stages and typically report different results for males and females. This differentiation of the sexes may have a limiting effect on the career options that are available to one sex or the other, and thus sex bias may be introduced.

A tentative operational definition of sex bias has been adopted by the Career Education Program planning group of the National Institute of Education, as follows: "Within the context of career guidance, sex bias is defined as any factor that might influence a person to limit—or might cause others to limit—his or her consideration of a career solely on the basis of gender."

The scope of this paper will be to review the major interest inventories, to explore the nuances and complexities of the technical aspects in the development of interest inventories—their item sampling, norming, scoring, reporting of results, and changing patterns of interests in relation to the differential treatment of sexes—and to suggest guidelines to eliminate or alleviate any potential sex-biasing factors.

MAJOR INTEREST INVENTORIES: A BRIEF OVERVIEW

Currently, two major interest inventories are used to provide results that are helpful in vocational guidance: the Kuder Occupational Interest Survey (OIS) and the Strong Vocational Interest Blank (SVIB). These two inventories have handled the roles of males and females in the occupational world in slightly different ways.

The OIS is intended for grades 11-12, college students, and adults (Kuder, 1966). Scales range from professional and college major levels down through skilled and semiskilled. It contains 100 items in a forced-choice format. For example, the subject is presented with a pattern of three possible activities, such as "Go to the movies," "Play cards," and "Go to a big party," and is to pick the one liked most and the one liked least or disliked. Results indicate the similarity of the person's interests to those of satisfied subjects in a variety of occupations and college majors.

About 60 occupational-based scales and 30 college-major-based scales are reported for the inventory. Male and female subjects respond to the same items. In an earlier reporting system for the OIS the results for males were based on male criterion samples, whereas scores reported for females were based on female criterion samples and on male samples for selected scales where there was no female criterion sample. Thus males and females were treated separately in scale development and reporting of results.

Recently the reporting of scores for the OIS has included all scores for all subjects (Kuder, 1974). Scores reported for males are based on

male criterion groups and female criterion groups, and results for females are handled in the same way. However, males and females are still treated separately during scale development.

The SVIB is geared more for professional than for nonprofessional occupations (Campbell, 1966b, 1971; Strong, 1943, 1959). Generally, each subject is asked to respond "Like," "Indifferent," or "Dislike" to 400 items that cover a variety of areas such as occupational titles, activities, and amusements. Currently, about 55 occupational scales are reported, such as Mathematician, Chemist, and Life Insurance Sales. In addition there are about 20 basic interest scales, or homogeneous types of scales that measure interest preferences in broader terms, such as Mechanical, Teaching, Sales, and Sports. (The exact number of scales reported depends on the sex of the subject.) The SVIB treats males and females distinctly from the very start with a separate set of test items for males and females. Although many items are identical in the male and female forms, about 40 percent of the items are unique to each sex.

In response to recent criticism of the SVIB as it relates to sex bias, the inventory has recently been revised and updated. One of the major changes has been the combination of the male and female forms of the SVIB into a single inventory—the Strong-Campbell Interest Inventory (SCII)—with an identical item pool for both sexes and scores for all individuals on all scales. The SVIB, however, with its separate male and female forms, is still available for use.

Therefore both the Kuder and Strong inventories may introduce a potential sex bias by a differential treatment of the sexes. The introduction of sex bias can occur at several different stages in the development of an interest inventory: in actual test items that appear on the inventory, in construction and norming of scales, and in reporting of results.

TEST ITEMS

The various Kuder inventories have one form to be used by both males and females, and thus all subjects are asked the same set of questions. There is a nondifferential treatment of males and females at the item level.

The SVIB, however, is unique in offering a separate test booklet and different items for each sex. Although there is considerable overlap in the item content between the male and female versions, more than one-third of the test items are unique to each sex. For example, the male version of the SVIB, Form T399, asks the subject to respond "Like," "Indifferent," or "Dislike" to the occupations "military officer," "high school principal," "geologist," and "public relations man," but the female version, TW398, omits these items. Likewise, females are asked to respond to "supervisor in telephone office," "stewardess," "receptionist," and "fashion model" and these items are not in the male version. (As explained earlier, this is not true of the recently developed SCII.)

There are both males and females gainfully employed in the above occupational examples—there are female military officers and male fashion models, and questions on these items should be acceptable for either males or females. When different sets of items are used with males and females, there may be speculation that some types of activities and vocations are more appropriate for one sex than the other. Doubt may be raised about the appropriateness of females liking to be in the military or having mechanical interests, or of males liking to do cooking, teach children, or be a flight attendant.

The SVIB has a long history of providing separate test forms for females and males. The first version, published in 1927, was intended to provide vocational guidance for males; six years later, in 1933, the SVIB for females was published. During the 1930's there were differing employment patterns for men and women; most of the trades and professions, such as mechanics and dentists, had a heavy representation of males, while women dominated the secretarial and elementary school teaching positions. Two forms have been retained for the past 40 years, primarily because of the differing patterns of males and females in some occupations and because of demonstrable differences in responses of men and women to the same items.

These factors have sufficed to keep the SVIB male and female forms separated in the past,

but a growing interest in equal rights and opportunities and concern over possible career limitations have become of primary importance.

RECOMMENDATION

The recommended solution for avoiding any possibility of sex bias at the item level is to ask the same set of questions of both males and females. Special care should be taken to phrase the items so that they do not inherently refer to one gender. For example, *police officer* would be preferable to *policeman* or *policewoman, realtor* to *real estate salesman,* and *salesclerk* to *saleslady.*

When gender cannot be eliminated from the item, the item should include both possibilities: for example, *dressmaker/tailor, waitress/waiter. Airline flight attendant* would be better than *airline steward/stewardess* from a sex-bias standpoint, but perhaps not as easily understood by high school students (the reading level and comprehension of the items also must be a consideration if the inventory is to be applicable to high school students).

With enough effort and care, items can be written so that one gender is not inherently favored, and this is perhaps the easiest solution to avoiding sex bias during the development of an interest inventory.

MALE-FEMALE ITEM RESPONSE DIFFERENCES

Male and females do differ in their base rates of responding to interest items. For example, when responses to the SVIB item "interior decorator" are investigated by gender, a substantial majority of women answer "Like" (67 percent of a representative sample of 1,000 employed women) whereas a minority of men respond "Like" (28 percent of a representative sample of males). Consequently, when a male responds "Like" to the item, he is giving an unusual response—one that might be expected from an artist, actor, or architect—whereas a female responding "Like" to the same item is indicating little that is unique for her gender.

Similar types of male-female differences are found for the Kuder. For example, in responding to the item triad "Go see a fire," "Go see an accident in which people have been hurt," and "Go see a famous person riding along the street," 57 percent of men-in-general indicate they would rather go see a fire, in contrast to 33 percent of women-in-general. While 60 percent of the women-in-general would prefer to see a famous person, only 33 percent of the men-in-general would prefer that activity over the other two.

Results from teenagers. Research by Campbell (1974) on the differences between males and females in the patterning of interests indicates that such differences appear even among early teenagers. Table 1 lists occupational items (from a list of 130) to which a majority of eighth grade males or females responded "Like." With the exception of the occupations cartoonist and professional athlete, there is a definite difference in the responses of males and females even at this early age.

As young males and females grow older, the magnitude of the differences diminishes somewhat, but never vanishes. The SVIB has had a Masculinity-Femininity (MF) scale for many years to measure adult male versus adult female interests based on item responses, as have many personality tests such as the Minnesota Multiphasic Personality Inventory (Welsh & Dahlstrom, 1956) and the California Psychological Inventory (Gough, 1969).

Results from adults. With development of a female version for the SVIB in the 1930's, Strong was able to measure the extent of different base rates of responding to interest items by males and females. The MF and FM scales measure those differences (Strong, 1943). Research by Johansson in 1969 (reported in Campbell, 1971) resulted in further refinement of these scales.

Refined MF and FM scales were developed as part of a project studying male-female differences within occupation in response to the same items. When occupational membership was held constant, employed adult males and females showed significant and practical differences. Fourteen occupations were available that had an adequate sampling (sample sizes: about 250) of both males and females. All subjects indicated they were satisfied with their jobs, and all

TABLE 1.—*Popular occupations among male (N = 81) and female (N = 76) eighth graders*

Occupation	Male percentage "Like"	Female percentage "Like"	Percentage difference
Occupations marked "Like" by more than one-half of the boys:			
Auto racer	65	24	41
Jet pilot	57	22	35
Cartoonist	57	61	−4
Professional athlete	53	45	8
Inventor	51	17	34
Occupations marked "Like" by more than one-half of the girls:			
Children's clothes designer	14	76	62
Interior decorator	21	68	47
Fashion model	11	66	55
Costume designer	13	64	51
Steward/stewardess	20	64	44
Actor/actress	33	63	30
Home economics teacher	12	61	49
Cartoonist	57	61	4
Elementary teacher	26	61	35
Nurse's aide/orderly	10	59	49
Manager, child care center	11	58	47
Dressmaker/tailor	15	57	42
Photographer	34	56	22
Manager, women's style shop	10	55	45
Waiter/waitress	16	55	39
Artist	35	54	19
Typist	9	53	44

had been employed in their occupation for at least three years. Each occupation was represented equally by both sexes. Thus the samples were very precisely defined, and the possibility of spurious results from comparable random samples of males and females was lessened.

This research was important in investigating the extent of similarity or dissimilarity between an average composite of males and another of females when samples from the same occupations were compared. Investigation of these male-female differences within each specific occupation leads to three tentative hypotheses (Campbell, 1974):

1. Men and women in the same occupation do not differ in their interest preferences.
2. Men and women have different interests which are constant across all occupations.
3. Men and women have different interests which are specific to each occupation.

Table 2 shows the number and percentage of items that showed large differences (15 percent or greater) between males and females within each occupation. Clearly there are considerable differences between males and females even when occupational membership is controlled; about 30 percent of the items in question showed large differences. The items investigated were the 229 items overlapping between the male and female forms of the SVIB.

Those items that showed significant differences between the sexes were aggregated into the refined MF scale. Interests that were more typical of males than of females included business interests and outdoor and adventuresome

TABLE 2.—*Number of items, by occupation, of 129 that show "Like" or "Dislike" response differences of 15% or greater between males and females*

Occupation	Male-female differences	
	Number of items	Percentage
Artists	60	26
Bank personnel	97	42
Chemists	57	25
English teachers	73	32
Interior decorators	47	20
Lawyers	67	29
Life insurance sales	90	39
Mathematicians	49	21
Math-science teachers	93	41
Medical technologists	55	24
News reporters	76	33
Physicians	61	27
Psychologists	47	20
Social science teachers	96	42
Average	69	30

types of activities. Interests more typical of females involved cultural activities—fine arts, music, art, literature, and the like.

Whether differences are constant or unique to each occupation can be determined from table 3, which lists all items that showed very large differences (25 percent or greater) between the SVIB men-in-general (MIG) samples (N = 1,000) and women-in-general (WIG) samples (N = 1,000). For the first 14 items, females responded "Like" more frequently than males; for the last 5 items, males responded "Like" more frequently. Also, the differences between the percentages of males and of females in the 14 occupations who responded "Like" to each item appear as the table entries. For example, 61 percent more of the females in the in-general sample prefer to "decorate a room with flowers" than do males (75 percent of the women versus 14 percent of the men).

The first and last columns of table 3 indicate that the entries are very similar, differing by only one or two percentage points. Thus, as the

TABLE 3.—*SVIB items showing very large differences between men and women in the same occupations*

Item	Percentage differences in "Like" responses															
	MIG vs. WIG	Artists	Bank personnel	Chemists	English teachers	Interior decorators	Lawyers	Life insurance sales	Mathematicians	Math-science teachers	Medical technologists	News reporters	Psychologists	Social science teachers	Physicians	AVERAGE
Items favored by women:																
Decorate a room with flowers	61	49	64	55	57	23	54	62	43	59	55	66	59	62	58	55
Interior decorator	47	37	48	35	43	2	43	46	23	35	41	54	45	48	40	41
Work with babies	28	15	34	19	19	33	12	35	36	19	12	19	18	18	13	22
Religious music	27	20	38	27	19	16	29	19	12	29	14	25	20	27	28	23
Magazines about art and music	27	9	31	22	23	11	11	22	16	21	21	29	28	37	26	24
Private secretary	26	3	51	11	27	0	20	37	16	34	12	18	22	28	16	22
Plan a large party	26	22	22	22	24	17	24	22	19	23	7	33	18	29	11	21
Work with ballet dancers	25	17	29	13	25	18	23	38	19	19	23	28	25	28	25	24
Interpreter	25	10	25	25	22	13	29	19	18	18	15	27	24	29	15	21
Items favored by men:																
Travel alone	38	31	42	28	46	29	40	31	30	49	35	40	27	41	42	36
Popular mechanics magazines	33	25	25	18	36	20	29	28	11	24	29	30	24	40	25	26
Repair electrical wiring	29	20	33	17	39	21	24	33	17	34	28	24	27	31	25	27
State governor	25	21	24	13	30	10	18	19	27	32	32	30	12	25	25	23
Airplane pilot	25	32	34	12	22	13	19	30	14	35	13	18	19	25	19	22

first column indicates, men and women in a "general" sample do have different patterns of response to the same items and, as the last column indicates, these differences are fairly constant between males and females even when occupational membership is held constant.

The illustrated items show very large differences between the sexes; approximately one-half of the 325 items on the revised SVIB (released in 1974) indicate differences of 15 percent or more between the males and females constituting the in-general samples. (The increase over the 30 percent for the 229 items in table 2 is a result of including items relating to domestic, mechanical, and military types of activities that previously appeared on only one of the SVIB forms; these types of activities show large differences.)

Thus, even though good items can be written for males and females to alleviate potential sex bias by not inherently referring to only one gender, different response patterns by sex are a concern for scale construction and reporting of results.

SCALES

Another stage at which sex bias may become apparent is during the construction and norming of scales for an interest inventory. Two main types of scales frequently are developed: (1) *criterion* scales, where a person's preferences are compared with those of a criterion sample, such as an occupational sample of artists or a sample of college students majoring in biological sciences; and (2) *homogeneous* or basic interest scales, which measure a person's preferences relative to those in a general reference or normative sample on the underlying interest dimensions of the inventory. Each has its unique advantages in the type of information that it captures from items on the inventory, and each differs in the way that potential sex bias may be introduced.

CRITERION SCALES

Strong. Development of criterion or occupational scales for the SVIB involves contrasting item responses of people employed in a specific occupation (criterion sample) with those of a sample representing a population "average" (in-general sample). Each occupational scale contains those items that significantly differentiate the criterion sample from the in-general sample. There are various methodological considerations and problems that have to be considered in collecting a criterion sample and defining an in-general sample (Campbell, 1971; Clark & Campbell, 1965; Strong, 1943), but for the purposes of this paper the assumption is that adequate samples are available.

After item responses for the criterion sample and the in-general sample have been collected, item response percentages for both groups are calculated and compared. Items that show significant percentage differences (usually 15 to 20 percent) between the two groups are included in the occupational scale. Response patterns (for example: Like, Indifferent, or Dislike) for these significant items typically are assigned weights of zero or plus or minus 1, based on the magnitude and direction of differences between the criterion and in-general samples. The resultant scale is then normed on the criterion sample used for scale development.

The following example shows the response percentages of male psychologists and the male in-general sample for the two items "author of novel" and "employment manager."

Response	Male psychologists (N = 252)	Men-in-general (N = 1,000)	Response differences	Response weights
Author of novel:				
Like	81%	51%	30%	+1
Indifferent	15%	30%	−15%	−1
Dislike	4%	19%	−15%	−1
Employment manager:				
Like	35%	29%	6%	0
Indifferent	34%	41%	−7%	0
Dislike	31%	30%	1%	0

Based on years of research with the SVIB, a 15-percent or greater difference is considered large and meaningful (Campbell, 1971). Thus, if a person responded "Like" to the item "author of a novel," his or her raw score on the Psychologist scale would be increased by 1. If the response was "Indifferent" or "Dislike," the raw score would be decreased by 1. Responses to the

item "employment manager" would have no bearing on the score for the Psychologist scale, but it would be relevant for some other scales, such as the Sales Manager scale.

The number of items that differentiate an occupational sample from the in-general sample on the SVIB is usually 70 to 90, or about one-fourth of the test. A person's raw score on each scale developed for the inventory is the sum of plus and minus unit weights that correspond to his or her unique pattern of responses for each scale. The raw score is then converted to a standard score by using a conversion formula. Each person receives a standard score for each of the occupational scales developed for the inventory, indicating the degree of similarity between his or her interest preferences and those in the criterion sample based on the items that were more characteristic of the criterion sample than of the in-general sample.

Kuder. The Kuder OIS uses a somewhat different approach from that of the SVIB in the development of empirical criterion scales for the inventory. Because of difficulties found by Campbell and Strong in developing an adequate in-general sample, Kuder (1966) decided to circumvent the methodological problems by the use of a lambda coefficient, which is similar in concept to a biserial correlation coefficient. The lambda coefficient expresses the degree of similarity (correlation) between a subject's responses and those of members of the criterion group, such as an occupational sample. This procedure effectively eliminates the need for an in-general sample. The upper limit of lambda is 1.00, indicating complete similarity with responses of those in the criterion sample; a lambda of .00 indicates no similarity; and a lambda of −1.00 indicates a profile diametrically opposed to that of the criterion group. These coefficients are used as the OIS scores. Because of the method of scale construction, norming and standard score transformations are not a concern as they are with the SVIB.

Gender as a factor. Since the SVIB traditionally has separated the response patterns of males and females at the item level, so too are the responses separated at the scale development level. Male occupational samples are compared with a male in-general sample representing the "average" employed male, and female occupational samples are compared with a female in-general sample representing the "average" employed female. Thus it is not surprising to find that if a person completes both the male and the female SVIB, different scores will be obtained for same-named scales on the two inventories. For example, a person might obtain a score of 45 on the male Chemist scale and 40 on the female Chemist scale. Item content of the like-named scales is different, criterion samples are composed of different people, and the in-general samples are different.

The OIS also separates the sexes during scale development. For some occupations, such as lawyer and computer programer, there are separate and distinct scales for males and females. For others, such as dean of women and plumber, scales are based on just one sex. Currently, a subject is scored on all scales regardless of sex, and the same problem arises as with the two forms of the SVIB—where two scales exist for an occupation, one based on females and one on males, discrepant scores usually result.

The sex-bias concern is that there is not complete comparability in the scales that are developed for male and female forms of the SVIB and scales developed by gender for the OIS. The female SVIB contains scales that measure interest preferences for various nursing occupations, airline stewardesses, entertainers, and telephone operators. However, the male SVIB does not give an indication of these specific occupational interests, although there are adequate samples available for male airline stewards, male nurses, male entertainers, and male telephone operators (Schlossberg & Goodman, 1972). The male SVIB has a wider sampling of professional occupations such as biologist, architect, psychiatrist, and physicist, but these are not available on the female SVIB. A similar set of circumstances exists for the OIS.

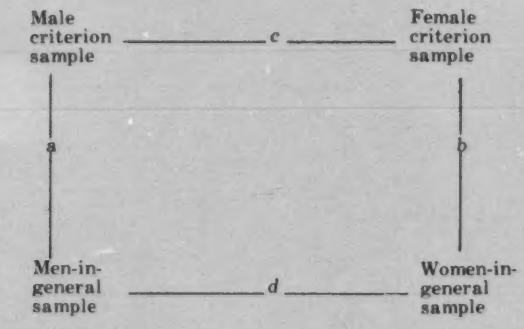
For someone concerned about sex bias in interest measurement, separation by gender when scales are developed and reported is a salient focal point. For example, are interests measured by the male form of the SVIB different in scope from those measured by the female form? How

important are these differences? If a woman wants scores on scales appearing on just the male form, then there is the problem of to what extent the results from male criterion groups can be generalized to apply to her interest preferences. This is also true of the OIS, but it is perhaps now more apparent.

Subjects completing the OIS are now presented with two scores for some occupations; with the SVIB, prior to the development of the SCII, the subject had to take two tests to obtain scores on all available scales. The following section investigates occupational scale characteristics when they are constructed on samples separated by gender.

Sexual stereotypes. The relative importance of sex-differentiating items in like-named scales developed on male criterion samples and female criterion samples is contained in research by Johansson and Harmon (1972) on the SVIB. The study specifically investigated (1) whether men and women in the same occupation have different interests, (2) whether these differences are reflected in occupational scales for men and women, and (3) whether such occupational scale differences are valid and useful.

Fourteen occupational samples and the in-general samples were used for analysis, as discussed previously. The following figure presents a paradigm of how item response differences were analyzed using male and female criterion samples and their relationships to the in-general samples.



The male occupational scale is based only on differences between the male criterion sample and the men-in-general sample (difference *a*). The female scale is based only on differences between the female criterion sample and women-in-general (difference *b*). Difference *c* represents items that differentiate male-female criterion samples; examples have been given in table 1. An item that shows a response difference between men and women in an occupation (difference *c*) can have four possible effects on male and female scales:

1. Male-female differences not incorporated in the scale. Despite a large item response difference (for purposes of this study, large was defined as 12 percent or greater) between males and females (difference *c*), the item appears on both scales because differences between occupational and in-general groups (differences *a* and *b*) are also large. Thus sex difference is not differentially incorporated into the scales. In example 1 there are large differences in the responses to the item "electronics technician" between male and female medical technologists, between in-general samples, and between criterion samples and the same-sex in-general sample. Even though the item is a sexually stereotypic item (a large difference between males and females), it is weighted the same for the male and female scales and does not produce a sex bias in the scale content.

Across all 14 occupational samples, approximately one-fifth of the items differentiated males from females in the criterion samples and were noninfluential because they were weighted identically on the male and female scales.

2. Valid male-female differences incorporated in the scales. Although there is a large difference between the criterion groups (difference *c*), only one of the differences between the criterion groups and the same-sex in-general sample (difference *a* or *b*) is also large; thus the item appears on only one of the occupational scales. In this situation difference *d* in the paradigm is small. Example 2 shows that responses to the item "computer operator" are weighted on the male scale for medical technologists but not on the female scale. Differences between male and female medical technologists are large, but this difference is specific to the occupation, since the in-general samples show a much smaller difference.

EXAMPLE 1

Noninfluential male-female differences: response percentages for the item "electronics technician"

Response	Medical technologists			In-general samples			Response weights	
	Male	Female	Difference	Men	Women	Difference	Male scale	Female scale
Like	55%	35%	20%	22%	11%	11%	+1	+1
Indifferent	35%	36%	1%	42%	30%	12%	0	0
Dislike	10%	29%	−19%	36%	59%	−23%	−1	−1

EXAMPLE 2

Valid male-female differences: response percentages for the item "computer operator"

Response	Medical technologists			In-general samples			Response weights	
	Male	Female	Difference	Men	Women	Difference	Male scale	Female scale
Like	31%	28%	3%	14%	22%	−8%	+1	0
Indifferent	51%	34%	17%	37%	29%	8%	+1	0
Dislike	18%	38%	−20%	49%	49%	0%	−1	0

EXAMPLE 3

Nonvalid male-female differentiating item: response percentages for the item "art galleries"

Response	Psychologists			In-general samples			Response weights	
	Male	Female	Difference	Men	Women	Difference	Male scale	Female scale
Like	66%	86%	−20%	42%	66%	−24%	+1	0
Indifferent	25%	11%	14%	39%	24%	15%	−1	0
Dislike	9%	3%	6%	19%	10%	9%	−1	0

EXAMPLE 4

Nonvalid in-general differentiating item: response percentages for the item "inventor"

Response	Psychologists			In-general samples			Response weights	
	Male	Female	Difference	Men	Women	Difference	Male scale	Female scale
Like	73%	71%	2%	62%	44%	18%	0	+1
Indifferent	22%	22%	0%	28%	35%	−7%	0	0
Dislike	5%	7%	−2%	10%	21%	−11%	0	−1

This illustrates the inclusion in scales of a valid or legitimate sex difference in interests between males and females in the same occupation. Averaged across all 14 occupational samples, approximately 10 percent of the scale items fell into this category.

3. Nonvalid male-female differentiating items incorporated in the scales. Items that differentiated the two in-general samples (difference *d*) were regarded as sexually stereotypic, since the differences held for all males and females and for males and females in the criterion samples. When such a sexually stereotypic item appeared on only one scale, it seemed to be spuriously related to the magnitude of the difference between the criterion sample and the in-general sample. Example 3 shows this relationship for the item "art galleries." Males and females in the criterion and in-general samples show large differences, but the item is weighted only on the male Psychologist scale.

While items in examples such as this represented significant differences between males and females in the criterion samples and the in-general samples, the items were related to sex stereotypes that had been included fortuitously in the scale for one of the sexes. Fortunately, only a few items of this type are included in the scales.

4. Nonvalid in-general differentiating items incorporated in the scales. Again, differences between the in-general samples (difference *d*) were considered sexually stereotypic. If the item showed a small difference between the criterion samples (difference *c*) but was included in one of the scales because of a large difference between a criterion sample and an in-general sample (difference *a* or *b*), another type of invalid difference had been included in the scales. As illustrated in example 4, male and female psychologists respond similarly to the item "inventor," but the in-general samples show large differences. The item is weighted on the female Psychologist scale but not on the male scale. The male and female scales differ, not because people in the occupation differ, but because in-general samples differ.

These last two types of differences (3 and 4), influencing one scale and not the other, did not represent a valid inclusion of the item in the scale for one sex and not for the other. Across all 14 occupational scales studied, about 18 percent of the items represented such inclusion of nonvalid sex differences.

In summary, more than 70 percent of the items on the SVIB scales studied did not differentially incorporate sexually stereotypic items into male and female scales. Of the remaining items on the scale, about 10 percent were items reflecting valid sex differences and fewer than 20 percent were invalid inclusions. Thus, depending on one's point of view, 70 percent can be taken as the overriding proportion of items with little sex bias or 20 percent can be viewed as justifying change.

Solutions to the problem. These differential base rates of responding to individual items for the sexes remained stable through the late 1960's and probably will be apparent for years to come. They cannot be ignored and become a vexing problem when occupational scales are developed. There are four possible strategies that can be used in handling this problem, as outlined by Campbell (1974):

1. A simple solution would be to ignore sex, randomly collect criterion samples, and let the proportions of males and females in the sample match the population split. There would be two disadvantages in this approach: (1) Some occupations still have a low percentage of one sex in the occupation—for example, female carpenters—and collecting a truly random sample with sufficient representation of both sexes would be impossible. (2) If occupational scales are constructed by contrasting a criterion group with an "average" sample, such as an in-general sample, the composition of the in-general sample would overrepresent those occupations where there is a preponderance of one sex.

2. Use an equal representation of males and females in the composition of criterion groups, again developing just one scale for both sexes. As in the first alternative, adequate samples of both sexes are extremely difficult to collect and almost impossible for some occupations. Where there are sufficient members of an occupation, male response preferences could be statistically

weighted equally with female response preferences. For some occupations, however, a low representation of one sex would lead to instability in the combined responses for the total group. This procedure would wash out items that are valid for one sex but not for the other —for example, "decorating a room with flowers" is more important if a male responds "Like" than if a female responds "Like."

3. Develop separate scales for males and females and then equate scores through a statistical formula appropriate for each occupation. This would be analogous to procedures used by some graduate schools in applying differential weights to grade point averages obtained at various undergraduate institutions, with heavier weights corresponding to the more academically "hard" institutions. However, considerable research would have to be done on such modifications of scores to investigate the impact of such a procedure. The end result probably would be the same as with the second alternative above.

4. Develop separate scales for males and females, as is currently done for the OIS and the SVIB. This is the easiest to do from a developmental standpoint and yields the best predictive and concurrent validity for the inventory. Studies by Berdie (1961), Dunnette and Kirchner (1958), Frederiksen, Melville, and Gilbert (1954, 1960), Ghiselli (1963), Grooms and Endler (1960), Johnson and Johansson (1972), and Seashore (1961) have shown the efficacy of moderator variables in increasing the validity of measurement. Using sex as a moderator variable increases the validity of scales by including those items that are most differentiating for each sex.

Recommendation. Collection of occupational samples is a costly venture, but the demonstrated predictive validity of empirical scales developed on criterion samples makes the utility of this approach worthwhile. Wherever feasible, a concerted effort should be made by the test developer to collect adequate samples of each sex for an occupation. Construction of separate scales for males and females is technically sound from the standpoint of concurrent validity. It is recommended, however, that greater care be taken to assure that nonvalid sex-differentiating items, as outlined previously, are not incorporated into the scales.

Use of criterion scales developed on the opposite sex. Currently, scores reported for subjects are based on opposite-sex criterion samples for the OIS, and for the SVIB if the opposite-sex test is administered. This procedure will continue until adequate representation of both males and females in all occupations is accomplished. The utility of this procedure has been explored in various research studies.

Research by Cole (1973) on female interests and Cole and Hanson (1971) on male interests, using data on the SVIB, OIS, and two other inventories, suggests that there are similarities between occupational configurations of women's interests and configurations of men's interests. These configurations could be useful in providing additional information about career opportunities for males and females even though there are no relevant specific scales on the inventory. The Cole and Hanson research indicates that there is enough similarity in interest structure between sexes so that generalizations beyond the status quo of an inventory are possible in exploring new career opportunities for males and females. Although these findings are important in understanding configuration of interests, test users will find occupational scores the easiest to use and there still is the problem of reporting scores for females based on male criterion groups and reporting scores for males based on female criterion groups.

Applicability of occupational scales developed on male criterion groups for females taking the Kuder D (predecessor of the OIS) has been studied by Hornaday and Kuder (1961). They found that scales differentiated for women as well as they did for men for 9 of 10 scales studied. In a similar study involving the OIS, Kuder (1966) found high median correlations between scores based on male criterion samples and female criterion samples for three samples of women. Kuder concluded that the reporting of scores for females based on male criterion samples was a valid procedure for representing their interests in fields where there are opportunities for women but criterion data were not available. Kuder (1966) also stated that if a woman enters an

occupation dominated by males, she will find greater satisfaction if her interests resemble those of the males in the occupation.

More recently, Kuder (1974) has stressed the importance of giving more emphasis to scores based on the subject's own sex and uses scores based on the opposite-sex criterion scales to give added insight into a subject's interests. If the person scores highest on several opposite-sex criterion scales, these scores may indicate good possibilities for further exploration of options not represented by same-sex scales.

Darley and Hagenah (1955) found using both forms of the SVIB to be beneficial for women who had a high degree of maturity, ability, and career motivation. Strong (1959) suggested that the male form could be used for women who have interests (as shown by the MF scale) and career aspirations similar to those of males. Thus there is some evidence on the efficacy of reporting scores for scales based on criterion samples that are of the opposite sex from that of the test taker.

A study by Laime and Zytowski (1964) also indicated that for women who took both forms of the SVIB, scores on several males scales could be predicted from corresponding female scales. In addition, more professionally oriented females tended to receive higher scores on certain scales of the male form than on the female form.

Huth (1973) cites criticisms of the SVIB as it pertains to measurement of female interests. She generally concluded, as did Super and Crites (1962) 10 years earlier, that the female SVIB does not show good differentiation of interests for the majority of women. There seems to be a commonality of interests among women that makes differentiation difficult except in cases where women have clear-cut interests. The general pattern seems to be a home-versus-career orientation. Thus, if women have had a strong career orientation, the male SVIB has been used frequently to provide the necessary differentiation of occupational interests.

A more extensive analysis of the same type of data was done by Campbell (1974). Using only items that were common to the male and female forms of the SVIB, he developed 31 male and 31 female occupational scales and normed them on appropriate-sex norm groups. For example, a male Physical Therapist scale was developed and normed on male physical therapists, and a female Physical Therapist scale was developed and normed on female physical therapists. Next, a general sample of 200 males and 201 females were scored on the 62 scales (31 male-based and 31 female-based scales), correlations were computed between the two scales for each occupation, and mean differences in score value were derived. Table 4 presents the results of this study.

The median correlation between same-named scales for the SVIB reported in table 4 (r = .76 for the male sample and .77 for the female sample) was equal to the magnitude obtained by similar studies on the OIS (Kuder, 1966). The magnitude of the correlations would indicate that there is a great deal of similarity between scales developed on male criterion groups and those developed on female criterion groups, but not sufficient similarity to interchange scales *carte blanche*.

The mean-difference column entries are important in investigating the scores for females on scales developed on male criterion samples and the scores for males on scales developed on female criterion samples. Of importance is the direction of the difference between the male scale means and female scale means. Since the means are for random samples of males and females, low scores on occupational scales are desirable; negative differences indicate that appropriate-sex scales are superior, and positive differences indicate that opposite-sex scales are superior. The results indicate that scales based on male criterion groups work best for males and scales based on female criterion groups work best for females.

The average absolute difference between the two scales for each occupation in table 4 was about one-half standard deviation (5.5 standard score units for males and 6.7 for females). If there were no overall differences in scales developed on male and female criterion samples, then the difference would be about zero. This clearly was not the case; mean differences of the magnitude of one-half standard deviation on SVIB occupational scales are statistical and meaningful differences.

TABLE 4.—*Results of using male and female scales with male and female samples*

Scale	Male sample				Female sample			
	Correlation between M & F scales	Male scale mean	Female scale mean	Mean difference	Correlation between M & F scales	Female scale mean	Male scale mean	Mean difference
Physical Therapist	.87	33	37	−4	.90	35	27	+8
Army Officer	.65	33	45	−12	.63	31	21	+10
Army Noncommissioned Officer	.73	33	43	−10	.71	31	21	+10
Engineer	.90	38	38	0	.89	20	25	−5
Mathematician	.79	24	30	−6	.77	17	26	−9
Computer Programer	.91	37	38	−1	.88	24	26	−2
Math-Science Teacher	.64	34	39	−5	.64	30	27	+3
Medical Technologist	.85	26	36	−10	.89	26	20	+6
Dentist	.61	31	33	−2	.76	24	31	−7
Physician	.76	29	37	−8	.81	25	24	+1
Psychologist	.82	29	31	−2	.85	21	34	−13
College Professor	.73	36	42	−6	.75	33	41	−8
Artist	.81	25	28	−3	.83	26	35	−9
Interior Decorator	.72	24	15	+9	.68	17	39	−22
Musician	.56	34	25	+9	.59	36	46	−10
English Teacher	.89	30	23	+7	.90	33	40	−7
Librarian	.75	23	30	−7	.73	31	38	−7
Reporter	.84	28	32	−4	.85	31	38	−7
Social Worker	.91	25	27	−2	.90	29	31	−2
Recreation Leader	.94	29	33	−4	.92	35	27	+8
Elementary Teacher	.57	34	23	+11	.46	35	39	−4
Music Teacher	.75	23	18	+5	.71	27	39	−12
Guidance Counselor	.83	30	27	+3	.78	31	31	0
Social Science Teacher	.74	33	34	−1	.72	33	34	−1
Lawyer	.71	31	38	−7	.73	28	33	−5
Life Insurance Sales	.83	23	28	−5	.75	24	20	+4
Buyer	.76	26	27	−1	.75	24	24	0
Pharmacist	.46	29	34	−5	.58	27	26	+1
Accountant	.77	23	32	−9	.78	20	9	+11
Banker	.76	30	33	−3	.73	29	21	+8
Business Education Teacher	.74	31	20	+11	.69	21	29	−8
Average	.76			5.5	.77			6.7

In investigating the item composition of the above scales, Campbell found that scales containing sexually stereotypic items influenced the magnitude of the score differential between males and females. Males tended to score highest on female scales dominated by "male" types of items, such as the female scales for Army Noncommissioned Officer and Army Officer, than on the corresponding male scale, whereas females scored highest on male scales dominated by "female" types of items, such as the male scales for College Professor, Musician, and English Teacher.

Recommendation. So as not to limit career opportunities available to males and females, it is recommended that scores be reported to both sexes for all scales available and, when possible, that they be based on the appropriate sex. When scores based on the opposite sex are reported, it is imperative that test users be made congently aware of this. When these opposite-

sex scores are used, they should be interpreted with sexual stereotypes and their potential effect on scores in mind.

HOMOGENEOUS SCALES

The second major type of interest scale developed for interest inventories is based on internally related items and labeled homogeneous or basic interest scales. Generally, each inventory, through its item content, covers a range of basic interest dimensions. Scales can be constructed through statistical procedures to measure these dimensions—for example, mechanical interests, social service interests, and numerical interests. Unlike the occupational scales, where the number of scales developed depends on the number of occupational groups that test developers are willing to spend time and money to test, the homogeneous scales are internally based and developed to tap all interest domains of the inventory. The male SVIB has 22 homogeneous scales and the female SVIB has 19. The OIS does not contain these types of scales, but a version intended for ages from junior high school students through adults—the Kuder General Interest Survey—has 10 such scales.

Scale development. Typically, a general or normative sample is tested with the inventory, and product-moment correlation coefficients are computed for all pairwise combinations of items by assigning numeric weights to response patterns. Then, by means of factor analysis or cluster analysis, highly interrelated items are aggregated into a scale and a descriptive name is applied that reflects some common psychological theme that is being measured by the individual items.

For example, the item responses "Like," "Indifferent," and "Dislike" on the SVIB were assigned weights of +1, 0, and −1 respectively, and then all pairwise item intercorrelations were computed on the basis of the responses of a general sample for the male form and a general sample for the female form. The example below shows a correlation of $r = .63$ between the items "algebra" and "arithmetic" based on responses of 500 males. (The table entries are response percentages of a general sample of employed males on two items considered as a pair; for example, 51 percent of the subjects responded "Like" to both "algebra" and "arithmetic.")

		Algebra				
		Like	Indifferent	Dislike	Total	
Arithmetic	Like	51%	12%	6%	69%	$r = .63$
	Indifferent	3%	11%	6%	19%	
	Dislike	1%	1%	10%	12%	
	Total	55%	24%	22%	100%	

These items "algebra" and "arithmetic," in addition to the items "calculus," "geometry," "mathematics," and "physics," appear on the basic interest Mathematics scale for the male SVIB. The same procedure was used for the SVIB female basic interest scales with a general sample of female responses. As with the occupational scales, the person's raw score on each scale is the sum of the response weights for the items included on the scale.

Again, because the SVIB has used separate sets of items for males and females, separate basic interest scales have resulted, with many overlapping concepts; but still some unique scales appear. For example, males are not scored on a Domestic Homemaking scale nor are females scored on a Military Activities scale. (This uniqueness is a direct result of not having sufficient appropriate item content in the inventory.) The previous recommendation that the same set of items be given to both sexes would eliminate this uniqueness in generation of results.

There are not two different sets of homogeneous scales for the SCII as there are for the SVIB. Females and males both receive scores on homogeneous scales that are not sex differentiated. Differences in responses between the sexes have been compensated for by separate interpretive distributions by sex.

The Kuder E has identical homogeneous scales for males and females and permits meaningful comparison between the sexes on their interest preferences. Using the same set of items for all subjects, the Kuder has overcome some of the unfavorable features of the SVIB.

Use of intercorrelations as the basis for scale development circumvents many problems asso-

ciated with development of occupational scales. If the same set of items is administered to both males and females, it is recommended that a general sample with equal representation of the two sexes be used in the construction of these types of scales. Predictive validity is of relatively less importance for internally based scales than for criterion scales, and differential rates of responding for males and females are not a real problem until scales are normed.

Norming. The reference sample used for norming homogeneous scales is determined by the test developer and generally the choice is influenced by which reference sample would be most relevant for interpreting results.

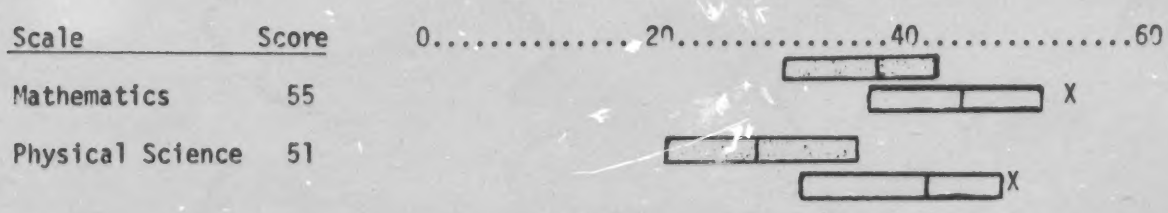
If a general reference sample is used where males and females are equally represented, there are two alternatives for the norming of scales and reporting of results.

One alternative would be to split the general reference sample or other reference sample by gender and provide separate norms for each sex so that the average male sample and the average female sample would have identical means and standard deviations. Such statistical manipulation to achieve equality of score distributions would actually disguise the underlying male-female differences. For example, a raw score of 10 on the Art scale may convert to a standard score of 50 based on a male reference sample, but the same raw score of 10 for a female may convert to a standard score of 45. The end result is that the same degree of interest would produce different standard scores. (Separation of the sexes when constructing empirical occupational scales can be faulted by the same argument. However, the intercorrelational procedure permits the combining of male and female responses without washing out differential response rates, and the predictive validity of homogeneous scales is not an overriding concern. Both these factors make the use of a combined male-female sample more acceptable for internally based scales.)

The other alternative is to develop one scale for both males and females, using the general reference sample, to norm the scale on the male-female composite, and to provide normative data separated by gender when results are reported. This procedure would convert a raw score to the same standard scores regardless of gender, but interpretive norms would provide necessary information about differences in male-female score distributions. The procedure is similar to that for reporting scores on the Comparative Guidance Placement Program of the College Entrance Examination Board.

The following example illustrates the recommended reporting of scores on two homogeneous, or internally based, types of scales, Mathematics and Physical Science, using a male-female composite group for norming purposes but splitting the interpretive data by gender. Standard scores are plotted, and easy reference to both male and female distributions is possible. Statements can be preprinted on the profile explaining that the white bar represents the normal range of male scores and the speckled bar represents the normal range of female scores, with vertical lines representing the average. Good graphic representation could also indicate quartiles or 10th and 90th percentiles.

EXAMPLE OF HOMOGENEOUS SCALE OUTPUT



This procedure would also have the advantage of providing a more meaningful linkage to scores of male and female occupational samples. Since a standard score would represent an equivalent degree of interest expressed as responses to items on the scale regardless of gender, resultant score presentations for occupations (identified by sex) would give meaningful comparisons between males and females in the same occupation.

The procedure uses the same items for both males and females and yields identical standard scores from the same expressed interests on homogeneous scales regardless of gender. But it takes into account differential response frequencies for each sex when scores are related to normative data.

Sex differences. Table 5 shows mean raw score differences between males and females on the homogeneous-type scores for the Kuder General Interest Survey, Form E (Kuder, 1971). All differences between the sexes were statistically significant. Males scored much higher (more than 19 points) on the Mechanical scale than females, while females had more intense interests than males in Social Service. Generally, the results pattern sexually stereotypic roles, males scoring higher on Outdoor, Mechanical, Computational, Scientific, and Persuasive, while females scored higher on Artistic, Literary, Musical, Social Service, and Clerical.

CHANGE OF INTERESTS OVER TIME

Do interest preferences change over time? For individuals there will be a wide diversity in amount of change, and this will depend on their age when tested. As they become older, more and more experiences are encountered that will predispose them to like or dislike a particular activity more than previously, depending on the experienced reward value. Roughly one-third of the change in interest will occur prior to graduation from high school, one-third during college years (18-22), and one-third during adulthood, with a great deal of stability after the age of 25 (Johansson & Campbell, 1971).

Although considerable evidence exists indicating that people will change in their vocational interest preferences, do occupational group characteristics change sufficiently to invalidate tests constructed 5, 10, 20, or 30 years ago? Specifically, (1) are there general changes among various groups of people over time, (2) are these changes associated with the measurement of vocational preferences for specific occupational groups, and (3) are these changes on items that currently differentiate the sexes?

TABLE 5.—*Means and standard deviations for males and females on homogeneous scales of Kuder*

Scale	Students in grades 6-8				Students in grades 9-12			
	Males (N = 287)		Females (N = 433)		Males (N = 471)		Females (N = 691)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Outdoor	27.45	8.73	22.93	8.20	24.50	9.71	21.56	8.39
Mechanical	43.13	10.20	26.01	9.24	44.74	11.87	26.31	8.84
Computational	30.03	8.34	27.62	7.80	32.99	9.84	27.46	9.79
Scientific	39.33	11.54	29.94	10.87	39.01	11.71	29.26	10.90
Persuasive	54.90	12.01	49.53	11.06	55.60	13.15	51.57	12.54
Artistic	29.73	8.82	34.47	9.49	29.13	9.35	33.71	9.86
Literary	29.41	9.44	35.71	9.34	30.34	10.23	34.49	10.68
Musical	10.67	7.51	12.33	8.17	11.75	8.20	13.58	7.50
Social Service	46.85	12.45	59.35	12.64	44.34	13.61	60.49	13.84
Clerical	53.52	10.13	61.76	12.45	52.10	12.91	61.04	15.47

Source: *Manual, Kuder General Interest Survey, Form E* (1964, rev. 1971).

CHANGES IN ITEM POPULARITY

To investigate whether there were general changes in interests, occupational samples tested in the 1930's were contrasted with a matching sample from the same occupation tested in the 1960's (Campbell, 1971). Items that showed a significant change in the base rate of responding across a majority of the occupational samples were identified on both the male and the female SVIB. For example, about 10 percent of bankers tested in 1934 responded "Like" to the item "college professor," whereas about 30 percent of bankers tested in 1964 responded "Like." Approximately one-fifth of the items investigated showed large shifts in popularity over the 30-year span. These types of items were used to develop a Cultural Change scale; the scale correlated in the .80's with the test year of the sample. Thus a strong relationship existed between year tested and items constituting the Cultural Change scale. Investigation of items indicated that recently tested samples had a more positive liking for activities that were extroverted in content, and concurrently outdoor and skilled trades activities became less popular. Results were similar for males and females.

CHANGES IN GROUP CHARACTERISTICS

Since items could be identified that showed significant changes in popularity over time, the next question was whether these changes were also incorporated into occupational and homogeneous scales that measured the interest preferences of criterion groups. If occupational interest patterns do change with time, then interest invertories should be revised continually.

To investigate this problem, Campbell (1968a) went back to some of the SVIB's original criterion groups and tested the men who in the 1960's were holding the same job as those tested by Strong in the 1930's. Four samplings were done: (1) men who were ministers in 1965 were matched with ministers in the same church in 1927; (2) bankers of 1964 were matched with men in the same bank positions in 1934; (3) corporation presidents tested in 1965 were matched with presidents of the same companies in 1935; and (4) school superintendents tested in 1965 were matched with superintendents of the same school system in 1930. Table 6 presents the data of 12 experimental homogeneous scales (Johansson, 1969, 1974) that permitted comparison between the 1930's and 1960's testings (revision of the SVIB in the middle 1960's precluded an exact comparison on all but the 12 homogeneous scales). As is apparent in table 6, the means between the two testings were very similar—there were greater differences among the different occupations than between two samplings of the same occupation.

Inspection of SVIB criterion scores for two samplings of each of four occupational groups revealed the same results (Campbell, 1966a). The striking similarity of results for the two comparisons suggested that occupational scales developed in the 1930's were still relevant for the 1960's. Other research—by Thrush and King (1965) on medical students, by Ferguson (1958, 1960) on life insurance salesmen, by Campbell (1966a, 1968) on male and female psychologists, and by Matarazzo, Allen, Saslow, and Wiens (1964) on policemen and firemen—clearly indicated that occupational preference data do not show dramatic shifts over time.

However, there was a slight trend in the Campbell (1966a) study for the more recently tested occupations to score higher on more recently developed occupational scales. This was attributable to the use of an in-general sample that spanned testings over some 40 years, thus introducing a time-biasing factor. The modernization factor is a vexing problem and it is difficult to determine precisely when a criterion or reference sample becomes outdated. Because of the costs and time involved in developing samples, the data do not warrant a complete modernization of the inventory every 10 years. After 15 to 20 years, time-biasing factors may lead to spuriously inflated results on recently developed scales if scale construction uses an earlier in-general sample. Also, after 20 years, explaining to clients that they have interests similar to those of people tested 20 years earlier will raise a question of relevancy. Thus, after 10 to 13 years, the test publisher probably should consider seriously starting to develop the necessary plans and efforts for a major revision to be completed within the ensuing 5 years.

TABLE 6.—*Means for four occupations where the job was held constant over two testings*

Scale	Ministers (N = 98)		Bankers (N = 93)		School Supts. (N = 149)		Corp. Presidents (N = 25)	
	1927	1965	1934	1964	1930	1965	1935	1965
Office Practices	50	49	61	61	51	51	43	45
Merchandising	46	46	49	48	44	50	45	45
Business Management	52	54	54	56	54	59	50	52
Law/Politics	49	51	51	49	52	54	47	51
Teaching	55	58	39	44	57	59	42	49
Art	49	49	41	41	43	43	42	41
Writing	50	53	40	41	46	48	40	42
Sports	49	47	46	48	44	49	42	43
Mechanical	53	50	51	53	50	51	55	53
Physical Science	53	49	46	46	53	52	53	50
Numerical	51	49	52	54	54	55	57	57
Medical Service	50	49	47	47	46	50	43	45

NOTE: Standard deviations vary around 9.

CHANGES IN MALE-FEMALE DIFFERENCES

Data presented in the preceding discussion showed that even though occupational characteristics are fairly stable over long time spans, there were also individual items that showed significant changes in popularity. The next question is: Are items that differentiate the sexes also changing over time?

If differences between male and female vocational preferences are diminishing, then at some future time an interest inventory could be developed in which differential base rates of responding would not be a factor and sex biasing in test development would become a moot point. If differences are not disappearing, however, then differential response rates by gender will always have to be accommodated in the developmental system of interest measurement.

Data presented by Campbell (1974) specifically addresses the question of changing male-female differences within occupations over 38 years. Nine occupations were available with adequate samples of males and females who had been tested during the 1930's and 1960's. Table 7 reports the percentage responding "Like" to four items that typically show male-female differences. The first two items, "decorate a room with flowers" and "regular hours for work," usually are favored by females; and the last two, "repair electrical wiring" and "express judgments openly regardless of what people say," are favored more by males.

Data in table 7 clearly indicate that there was no decrease in the magnitude of the response differences between males and females within occupations from 1930 to 1968. Of the 36 contrasts (9 occupations times 4 items), 11 showed smaller male-female differences over time, while 25 showed larger differences; differentiation in male-female responding appears to have grown larger.

These four examples are not atypical; interest measurement must take into account the differences in ways that males and females respond. Until evidence is obtained that shows dramatic shifts are currently occurring, waiting for these differences to disappear would be futile.

SUMMARY

The scope of this paper has been to review the two major interest inventories and to explore the complexities of technical aspects in development of item sampling, norming, scoring, and reporting of results in relation to the differential treatment of sexes. Based on the operational definition of sex bias as any factor that may

TABLE 7.—*Male-female differences: 1930 versus 1969 samples (percent of each sample responding "Like")*

Occupation	Year	Items											
		Decorate a room with flowers			Regular hours for work			Repair electrical wiring			Express judgments openly		
		M	F	Difference	M	F	Difference	M	F	Difference	M	F	Difference
Artists	1930	42	87	−45	39	63	−24	29	17	+12	38	32	+6
	1968	31	80	−51	29	48	−19	24	11	+13	60	40	+20
Lawyers	1930	21	79	−58	57	59	−2	31	23	+8	55	49	+6
	1968	9	63	−54	30	40	−10	32	8	+24	66	49	+17
Life insurance sales	1930	34	85	−51	49	56	−7	35	15	+20	41	32	+9
	1968	14	76	−62	14	26	−12	31	8	+23	56	38	+18
Math-science teachers	1930	29	82	−53	76	89	−13	55	34	+21	29	15	+14
	1968	11	70	−59	45	80	−35	48	19	+29	49	20	+29
Physicians	1930	26	80	−54	60	67	−7	51	40	+9	26	28	−2
	1968	13	71	−58	40	50	−10	53	28	+25	58	27	+31
Psychologists	1930	15	80	−65	37	60	−23	50	33	+17	34	26	+8
	1968	13	72	−59	27	32	−5	38	17	+21	60	49	+11
Reporters	1930	30	83	−53	47	72	−25	22	12	+10	56	38	+18
	1968	12	78	−66	24	36	−12	25	9	+16	68	49	+19
Social science teachers	1930	19	90	−71	72	83	−11	36	14	+22	38	31	+7
	1968	7	69	−62	42	68	−26	26	7	+19	66	40	+26
YMCA-YWCA staff	1930	31	92	−61	55	60	−5	50	23	+27	37	21	+16
	1968	10	70	−60	36	33	+3	40	20	+20	35	38	−3

influence people to limit career opportunities solely on the basis of gender, the following recommendations are made for avoiding potential sex bias in the areas investigated.

ITEM SAMPLING

Interest inventories should not have separate forms for males and females. Potential sex biasing should be eliminated at the item-development level by using the same set of items for both males and females. Special care has to be exercised so that an item is not inherently more applicable to either gender.

SCALE DEVELOPMENT

Various factors have to be considered in the context of sex bias when scales are constructed for interest inventories. There are two main types of scales (externally based and internally based) for interest inventories, and each has its own distinctive problems relating to sex bias.

Criterion (externally based) scales. Externally based scales (occupational or criterion scales) are based on item responses of appropriate criterion samples. A person's score on criterion scales measures the extent of similarity of responses to those in a criterion sample. Of immediate concern in the development of criterion scales are the extent and magnitude of differences between male and female responses and how to accommodate these differences.

Empirical evidence is very consistent in showing that males respond differently than females do to many items on interest inventories. These differences are neither small nor infrequent. Furthermore, the magnitude of differences between males and females has not substantially diminished during the past 40 years. Combining responses of males and females in criterion samples would decrease the predictive and con-

current validity of empirical criterion scales. If possible, occupational scales should be developed on male criterion samples and female criterion samples. In the development of empirical scales for both sexes, care should be taken not to differentially include items that represent nonvalid male-female differences.

In order not to limit career options when an appropriate sex criterion sample is not available, scores should be reported for scales based on the opposite-sex criterion sample, but the user should be aware of the impact that sex stereotypes will have on the resultant score.

Stability of response preferences also are evidenced for occupational samples. Occupational scales developed in the past still show excellent concurrent validity almost 40 years later. However, when new scales are developed for an old inventory, a modernization factor occurs in the content of the new scales. Because of cost and time factors in revising an inventory, empirical data do not warrant a revision every 10 years. If newly developed scales are added to existing scales on an inventory developed 15 to 20 years earlier, this modernization factor is likely to occur. Interest inventories should therefore be revised at the latest after 20 years and preferably after 15 years. The revision would update the content of items and develop occupational scales more responsive to future changes in occupational patterns.

Homogeneous (internally based) scales. Internally based scales (homogeneous or basic interest scales) are based on interrelationships of items within the inventory. These scales measure content areas of interests such as mechanical, art, and social service interests, and are more relevant to the measurement of avocational types of interests. Because of the nature of scale development (item intercorrelations) and because predictive validity is less important for homogeneous scales than for criterion scales, responses of males and females could be combined into a general sample for computing the necessary statistics for construction of the scales. Using one sample with equal representation of males and females would lessen the impact of potential sex biasing, but differential response frequencies of males and females would still have to be a concern. The most meaningful solution would be to use the combined general reference sample as the norm sample for converting raw scores to standardized scores but to provide for separate interpretive norm distributions for males and females. Thus scores would be equivalent but would be interpreted differently according to gender.

Composition of an appropriate norm reference group for internally based scales would depend on the intended use of the inventory and the judgment of the test developer. For example, if the inventory is intended primarily for the armed services, the norm sample should be composed of armed service personnel and not junior high school students, or a general sample of adult males and females might be a more appropriate reference sample than college graduates. In any event, reference groups could be composed of equal numbers of males and females if results are presented with separate interpretive band widths that indicate male-female differences.

The use of a single norm sample also permits an easy linkage to scores of male and female criterion groups on these homogeneous scales, since the standard scores would be equivalent in meaning. Norm-referenced samples should be updated as frequently as occupational samples.

SOCIALIZATION BIAS

Many of the technical difficulties outlined above are a result of the substantial sex differences for many interest inventory items. The possibility of developing an effective inventory free of such bias seems remote. The SVIB has undergone numerous studies over 40 years to increase its validity, and major revisions in the last 10 years have eliminated less valid items, archaic items, and items that inherently favor one gender. The result is a single inventory (the SCII), in which considerable attention has been given to sex-biasing factors. Still, over one-half of the items show significant male-female differences. Eliminating items that are not free of socialization bias would seriously decrease the validity and viability of the instrument. Data indicate that changes within society that reduce

male-female stereotypes will have to be more dramatic in the future than they have been during the past 30 years if effective inventories free of socialization are to be constructed.

INTERPRETIVE MATERIALS

Any published interest inventory should have a sound and comprehensive test manual following the guidelines of the American Psychological Association as presented in *Standards for Educational and Psychological Tests* (1974). In addition to recommended standards for describing criterion groups, validity, reliability, and other factors, the manual and other interpretive materials should include a fairly detailed explanation of the extent and nature of male-female differences on the inventory.

Test developers should outline what procedures were used to handle male-female response differences during scale construction, norming, and reporting of results for the various scales in the inventory. Efforts made to assure the applicability of the items to both genders should be mentioned. Data should be presented indicating to what extent scales developed on either male or female criterion groups can be generalized or used for the opposite sex.

SUFFICIENT TIME AND MONEY

If sufficient time and money were available, what directions could be taken in the development of a new inventory that would lessen or eliminate the socialization effect? It may be possible to write a sufficient number of items to make a viable inventory and still show no large differences between sexes. This would involve an extensive developmental effort and the continual trying out of items on various groups of subjects to ascertain the instrument's validity.

Still, even though enough items that are relatively free of sex bias may be aggregated, small male-female differences may have a cumulative effect during construction and norming of the resultant scales. If sex differences existed in the scales, extensive validity studies would have to be done to measure the extent of the impact of these differences. Also, the data may show that for subjects who have strong, well-defined career aspirations, male-female differences are a minor factor and scales could be developed so as not to have a limiting effect on either gender. If results pointed in this direction, use of career commitment may be a more meaningful moderator variable than gender.

Various statistical procedures could be tried to compensate for male-female response differences, such as multivariate discriminant analysis, but such procedures would be applying differential weights, based on gender, to results, and considerable analysis would be necessary to show that these procedures do not decrease the validity of the inventory for both sexes.

In the long run, writing items that are as valid as current items and that show no male-female differences may be easier than trying to correct statistically for these differences on a post hoc basis.

REFERENCES

American Psychological Association. *Standards for educational and psychological tests.* Washington: Author, 1974.

Berdie, R. F. Intra-individual variability and predictability. *Educational and Psychological Measurement,* 1961, 21, 663-676.

Campbell, D. P. The stability of vocational interests within occupations over long time spans. *Personnel and Guidance Journal,* 1966, 44, 1012-1019. (a)

Campbell, D. P. *Manual for the Strong Vocational Interest Blanks.* Stanford, Calif.: Stanford University Press, 1966. (b)

Campbell, D. P. Changing patterns of interest within the American society. *Measurement and Evaluation in Guidance,* 1968, 1, 36-49.

Campbell, D. P. *Handbook for the Strong Vocational Interest Blank.* Stanford, Calif.: Stanford University Press, 1971.

Campbell, D. P. *Strong Vocational Interest Blank: Manual for the Strong-Campbell Interest Inventory.* Stanford, Calif.: Stanford University Press, 1974.

Clark, K. E. *The vocational interests of nonprofessional men.* Minneapolis: University of Minnesota Press, 1961.

Clark, K. E., & Campbell, D. P. *Manual for the Minnesota Vocational Interest Inventory.* New York: Psychological Corporation, 1965.

Cole, N. S. On measuring the vocational interests of women. *Journal of Counseling Psychology,* 1973, 20, 105-112.

Cole, N. S., & Hanson, G. R. An analysis of the structure of vocational interests. *Journal of Counseling Psychology*, 1971, 18, 478-486.

Darley, J. G., & Hagenah, T. *Vocational interest measurement*. Minneapolis: University of Minnesota Press, 1955.

Dunnette, M. D., & Kirchner, W. K. Validation of psychological tests in industry. *Personnel Administration*, 1958, 21, 20-27.

Ferguson, L. W. Life insurance interest, ability, and termination of employment. *Personnel Journal*, 1958, 11, 189-193.

Ferguson, L. W. Ability, interest, and aptitude. *Journal of Applied Psychology*, 1960, 44, 126-131.

Frederiksen, N., & Gilbert, A. C. Replication of a study of differential predictability. *Educational and Psychological Measurement*, 1960, 20, 759-767.

Frederiksen, N., & Melville, S. D. Differential predictability in the use of test scores. *Educational and Psychological Measurement*, 1954, 14, 647-656.

Ghiselli, E. E. Moderating effects and differential reliability and validity. *Journal of Applied Psychology*, 1963, 47, 81-86.

Gough, H. G. *Manual for the California Psychological Inventory*. Palo Alto, Calif.: Consulting Psychologists Press, 1969.

Grooms, R. R., & Endler, N. S. The effect of anxiety on academic achievement. *Journal of Educational Psychology*, 1960, 51, 229-304.

Hornaday, J. A., & Kuder, G. F. A study of male occupational scales applied to women. *Educational and Psychological Measurement*, 1961, 21, 859-864.

Huth, C. M. Measuring women's interests: How useful? *Personnel and Guidance Journal*, 1973, 51, 539-545.

Johansson, C. B. Psychometric characteristics of the inventory of interests. Unpublished Ph. D. dissertation, University of Minnesota, 1969.

Johansson, C. B. The Strong Vocational Interest Blank in general groups. *Journal of Counseling Psychology*, 1974, in press.

Johansson, C. B., & Campbell, D. P. Stability of the Strong Vocational Interest Blank for Men. *Journal of Applied Psychology*, 1971, 55, 34-36.

Johansson, C. B., & Harmon, L. W. The Strong Vocational Interest Blank: One form or two? *Journal of Counseling Psychology*, 1972, 19, 404-410.

Johnson, R. W., & Johansson, C. B. Moderating effects of basic interests on predictive validity of SVIB occupational scales. *Proceedings of the 80th Annual Convention of the American Psychological Association*, 1972, 7, 589-590.

Kuder, G. F. *General Manual, Kuder Occupational Interest Survey, Form DD*. Chicago: Science Research Associates, 1966.

Kuder, G. F. *Manual, Kuder General Interest Survey, Form E*. Chicago: Science Research Associates, 1964, rev. 1971.

Kuder, G. F. *Interpretive Leaflet, Kuder Occupational Interest Survey, Form DD*. Chicago: Science Research Associates, 1974.

Laime, B. F., & Zytowski, D. G. Women's scores on the M and F forms of the SVIB. *Vocational Guidance Quarterly*, 1964, 12, 116-118.

Matarazzo, J. D., Allen, B. V., Saslow, G., & Wiens, A. Characteristics of successful policemen and firemen applicants. *Journal of Applied Psychology*, 1964, 48, 123-133.

Schlossberg, N. K., & Goodman, J. Imperative for change: Counselor use of the Strong Vocational Interest Blank. *Impact*, 1972, 2, 25-29.

Seashore, H. G. Women are more predictable than men. Presidential address, Division 17, American Psychological Association Annual Convention, New York, September 1961.

Strong, E. K., Jr. *The vocational interests of men and women*. Stanford, Calif.: Sanford University Press, 1943.

Strong, E. K., Jr. *Manual for the SVIB*. Palo Alto, Calif.: Consulting Psychologists Press, 1959.

Super, D. E., & Crites, J. O. *Appraising vocational fitness*. (Rev. ed.) New York: Harper & Row, 1962.

Thrush, R. S., & King, P. T. Differential interests among medical students. *Vocational Guidance Quarterly*, Winter 1965, 120-123.

Welsh, G. S., & Dahlstrom, W. G. *Basic readings on the MMPI in psychology and medicine*. Minneapolis: University of Minnesota Press, 1956.

Face Validity of Interest Measures: Sex-Role Stereotyping

/5

Mary Faith Tanney
UNIVERSITY OF MARYLAND

ACKNOWLEDGMENTS

I would like to express my gratitude to Ms. Vivian Boyd and Ms. Sharon Bravy for their assistance in the review of the literature for this paper.

M.F.T.

ABSTRACT

A careful review of the literature in psychological measurement was undertaken, and that concerned specifically with overt sex bias in career interest inventories was examined. No empirical studies emerged that had explicitly focused on the impact of gender-linked terms (*he, she,* etc.) or gender-linked activities (such as flower arranging or repairing an automobile engine) on the responses of males and females, with the exception of often expansive and contradictory expressions of opinion. A further examination was conducted in fields closely related to psychological measurement to assess what they had uncovered in the realm of the effect of linguistic gender (usually male) dominance. Sociological, applied sociolinguistic, economic, sociopsychological, and reading literature proved to be

more fertile areas for the systematic examination of the impact of gender dominance.

An evaluation was made of three frequently used interest inventories—the Kuder Occupational Interest Survey, the new Strong-Campbell Interest Inventory (a 1974 updated, unisex version of the Strong Vocational Interest Inventory), and the Self-Directed Search. All instruments were carefully scrutinized for the presence of gender dominance in titles of activities and overall construction (administrators guide, test takers printout, test takers directions, and other components). Several criticisms were offered regarding these three instruments. Although interest inventories may not necessarily fall within the prescribed definition of "tests," they were also examined according to the American Psychological Association and National Vocational Guidance Association test standards. A request for a systematic examination of the impact of gender-dominant words and activities in item construction, directions, and interpretive materials in career interest inventories was proposed.

INTRODUCTION

Face validity, as defined by Cronbach (1970), is an elusive aspect of measurement. Face validity is not what the test can be empirically proven to examine, but what it appears superficially to measure. Does the test "look valid" to the examinees and to the test administrators?

This aspect of validity is viewed as a public relations or rapport-insuring phenomenon. If, on the surface, the test appears relevant to its purpose, it is said to have face validity. This is more difficult to evaluate than the other kinds of validity (concurrent, predictive, content, construct). Yet it is not to be inferred that face validity is unimportant. If the content of the test appears irrelevant, silly, or childish, it is unlikely that it will function effectively in practical situations. The vital component of useful test administration, the cooperation of the test takers, will quite likely be absent. With respect to sex bias, a better term for face validity might be *absence of overt bias.*

The particular focus of this paper is on the face validity or general appearance of interest measures as it may interact with sex-role stereotyping. Specifically, the concern focuses on the linguistic aspects of interest measurement and the possible effects on the test taker. Does the instrument convey gender appropriateness or sex bias for occupations, activities, or interests through the use of certain sex-linked words such as *he, she, policemen,* or *saleslady*? Does it present females or males in a stereotyped manner, lacking in individuality or conforming to an unvarying pattern of behavior (Title, 1974b)? If it does carry these types of items, do they affect the responses of the test takers? Do certain phrases commonly found in interest measures ("Do you like to . . .," "have never done . . .") preclude expression of interest in exploratory experience in an area the test taker has had no opportunity to explore (e.g., girls tinkering with an auto engine)? Additionally, the scope of this project includes the examination of the items selected by interest inventory constructors to attempt to measure whether the item content itself may be artificially restricting the response patterns of the test takers (e.g., in the realm of mechanical activities, is adjusting the timing on an automobile engine more useful an indicator of mechanical interest than rewiring a faulty electric plug or repairing a child's toy?). The final aspect to be examined in this paper is the extent to which existing American Psychological Association and National Vocational Guidance Association guidelines for tests and career materials can be applied to identify sex bias in career interest inventories and their components.

REVIEW OF THE LITERATURE

As previously mentioned, the effect of the gender-dominant aspect of test items is an elusive dimension. A careful review of the literature in psychological measurement revealed no empirical studies specifically concerned with this aspect of item construction. Indeed, only two studies (Kuder, 1970; Strong, 1962) offered standards for the construction of good and poor interest inventories. Neither of these articles specifically referred to the sex-role aspects of interest measurement.

Other disciplines have investigated the aspects of sex-role stereotyping. Some have measured the concept conveyed by the use of the word *man*; some have examined the language itself for evidence of subtle communications about the appropriateness of certain behaviors for men and women as they are reflected in the culture; others have described behaviors and observed the different reactions people have to these behaviors as a function of the sex to which the behaviors are attributed. These studies were examined by this author to assess the possible impact of sex-linked terms on interest inventories and their ancillary components.

Schneider and Hacker (1973) evaluated the perceptions of sociology students of the word *man* as used in introductory textbooks. Their results indicated that *man* was construed by their subjects to mean "male," not human beings of both sexes.

Bem and Bem (1973) explored the effect of sex-segregated want ads (such as those labeled "Jobs—Male Interest" and "Jobs—Female Interest") on the selection of jobs for which to apply. In this study the job descriptions themselves, in compliance with Federal and State laws, did not

express sexual discrimination unless membership in one or the other sex was a "bona fide occupational requirement." Their results, using a sample of female subjects, showed that the sex segregation of want ads discouraged women from seriously considering the jobs classified under the heading "Male Interest." When the jobs were segregated and labeled on the basis of sex, only 46 percent of the subjects were as likely to apply for the "Male Interest" jobs as the "Female Interest" jobs. When these same jobs appeared in an integrated, alphabetical listing with no reference to sex, fully 81 percent of the women preferred the "Male Interest" jobs to the "Female Interest" jobs.

Applied sociolinguists have also examined the sex-role components of language. Farb (1974) documented how English is a "sexist language that expresses stereotyped attitudes toward one sex at the expense of the other [p. 142]." He cited several ways in which the language gives unequal treatment to the two sexes:

> The Bible regards Eve as merely an offshoot from Adam's rib—and English follows suit by the use of many Adam's-rib words. The scientific name for both sexes of our species is the word for only one of them, *Homo*, "man" in Latin; our species is also referred to as *human* (derived from *Homo*) or *mankind*, two other words which similarly serve to make women invisible. The average person is always masculine (as in *the man in the street*) and so is the hypothetical person in riddles and examination questions (*If a man can walk ten miles in seven minutes, how many miles can he walk in twelve minutes?*). The word *he* is often used as a common gender pronoun, even though it is possible that a female is being referred to (as *When the vice-president of the company came to town he . . .*). If the antecedent is a high prestige occupational role, such as vice-president, manager, doctor, director, and so forth, then the pronoun is likely to be *he* whereas if the antecedent is a secretary, nurse, or elementary school teacher the pronoun is apt to be *she* [p. 141].
>
> * * * * * * * * * * * * * * * * *
>
> Even when the sexism is not built into the grammar and usage . . . the speech community often regards masculine values as the norm. Words like *master* and *father* have traditionally been those of leadership and power—as in *master of my fate* and *father of modern science*—while feminine words are used to imply unpredictability or treachery, which is one reason why the U.S. Weather Bureau has given feminine names to hurricans. *Heir, poet, laundry worker, singer,* and *Negro* are sexually neuter words in English and therefore they should apply equally to males and females. Yet, when referring to females, these words are often qualified to *heiress, poetess, laundress, songstress,* and *Negress*, as if males represented the standard and females a deviation from it [pp. 142-143].

This pervasive linguistic discrimination has several consequences. It would of course be unjustifiable to lay the responsibility for sex discrimination entirely on language, or on the linguistically supported notions of male supremacy. There are other factors, but they are beyond the scope of this paper.

The direct result of gender-linked occupational descriptions or titles, however, has received little or no empirical testing—rather a phenomenal discovery! Not that this has kept some agencies or publishers from acting on the assumption that it does have influence. The U.S. Department of Commerce has recently (1973) announced the adoption of changes in 52 sex-stereotyped job titles in the Census Bureau's occupational classification system to help eliminate the concept of "so-called 'men's jobs' and 'women's jobs.'" The assumption behind these changes follows the logic that it is unreasonable to expect women to apply for job openings advertised for foremen, salesmen, or creditmen and that it is equally unreasonable to expect men to apply for job vacancies calling for maids, laundresses, or airline stewardesses. Scott, Foresman and Company (undated) has also issued a policy statement on guidelines for nonsexist descriptions of behavior and for the inclusion of women and men in nonstereotyped illustrations. A task force authorized by the American Psychological Association (Birk, Banbanel, Brooks, Herman, Juhasz, Seltzer, & Tangri, 1973), after reviewing many psychology texts commonly used in graduate education, included in its guidelines several recommendations to counter the overuse of the male gender in writing style and to counter the notion that certain behaviors are automatically sex linked.

Summarizing the effect of the language used in interest inventories as a potential vehicle for perpetuating sex bias, the following can be stated:

1. No empirical test of the influence of labeling occupations, interests, or activities as gender specific has been reported in the field of occupational interest measurement.

2. Investigation in other disciplines strongly suggests that this variable may have an impact, though a subtle one, on the responses people make to questions about their vocational or vocationally related interests.
3. The potential hazards of gender specification would suggest that every caution should be taken in the construction of interest measures and related materials to insure that no "sex appropriateness" is conveyed.

EVALUATION OF INTEREST MEASURES

In the evaluation of interest inventories for the presence of sex bias, three instruments will be scrutinized: the Strong-Campbell Interest Inventory (Campbell, 1974), the Kuder Occupational Interest Survey, Form DD (Kuder, 1971), and the Self-Directed Search (Holland, 1972).

THE STRONG-CAMPBELL INTEREST INVENTORY

The new "unisex" SCII embodies many changes from the old Strong Vocational Interest Blank (SVIB). Available in the latter half of 1974, it probably will not be extensively used until early 1975. It represents perhaps most dramatically the response of one test constructor to charges of sex bias (Huth, 1973a, 1973b; Schlossberg & Goodman, 1972). In the SCII manual Campbell (1974) lists the alterations made in an attempt to "sexually neutralize the inventory."

For the purposes of this paper, only those alterations concerning sex bias will be considered. Under this rubric fall the efforts to combine the two booklets into one (thus avoiding the infamous "pink and blue" controversy), to eliminate explicitly sexist items (e.g., "Do you like stag parties?"), to eliminate reference to gender in occupational titles (e.g., police officer as opposed to policeman), to bridge traditional male-female occupational separations (e.g., male elementary school teachers), and to drop outmoded scales (e.g., the Masculinity-Femininity scale). These points will be considered in reverse order.

Campbell is to be congratulated for eliminating the MF scale, a measure frequently misinterpreted and possessing a plethora of surplus meaning. Constantinople's (1973) excellent review of the complicated concept of MF clearly supports the omission of such an ambiguous scale. As Diamond (1972) remarked, the use of the MF scale in interest measurement is "an idea whose time has passed."

Bridging traditional occupational separations conveys the philosophy that occupational choice should be made on the basis of the individual's talents and interests, not on the basis of what fields have been dominated by women or men. Yet, in the anticipated profile (Campbell, 1973), the occupational groupings with which an individual's pattern of interests will be compared will carry an "M" or "F" label. Although this labeling is designed to indicate the sex of the norm group, not the appropriate sex for the occupation, it may be a dangerous labeling subject to misinterpretation. Not all the occupations with which the test takers' scores are compared will carry both "M" and "F" labels. As Tittle (1974a) notes, the labels may convey to women that there are occupations that are still to be viewed as the purview of one or the other sex. Campbell (1972) does not refute the Schlossberg and Goodman (1972) charges that adequate samples of men and women would be available to provide data on occupations currently reserved for one sex on the SCII.

Campbell's efforts to eliminate gender titles in occupations also deserve applause. It is beyond the scope of this paper to delve into all the possible sociocultural reasons that could explain why women might react to sex-linked occupational titles in a manner that would limit their vocational choices. Previously cited research (Bem & Bem, 1973) indicates that this, for whatever reason, does occur. Removing this possible source of bias appears to be a reasonable course.

Excising specific sexist items is a step long overdue, and the combining of the men's and women's forms quite possibly may be one of those unobtrusive social communications (Webb, Campbell, Schwartz, & Sechrest, 1966) that convey a new view of the occupational world, one in which women's career goals are valued as much as men's.

THE KUDER OCCUPATIONAL INTEREST SURVEY

The Kuder OIS, Form DD, has been criticized in much the same manner as the old SVIB (Tittle, 1974a). The OIS has, however, recently undergone substantial revision. No longer will women's expressed interests be compared only on the 57 female-normed occupational scales. The controversial "Maxine Faulkner" profile in the *Interpretive Leaflet* is being replaced by one which would allow a woman's interest in traditionally male-dominated fields to emerge. However, the profile may still convey the "maleness" or "femaleness" of the occupations with which the interest patterns of test takers will be compared unless they clearly understand the difference between norm group designation and availability of the occupations to both sexes. How or whether this profile structure will affect career choices remains a question. The revision in the *Interpretive Leaflet*, which addresses some of the current differences in socialization for boys and girls, is a welcome one.

In general, the OIS is free from gender-linked items. A few, however, remain. Item 56 asks how a person feels about being "the chairman of a committee to plan a dinner for a special event"; item 77 asks a similar question about being the chairman of a club committee to plan programs. It would appear worthwhile to use a more sexually neutral term in these items (such as *chair* or *chairperson*). The question regarding the phrasing of items ("Have you ever . . .," "Do you dislike . . .") has been eliminated for consideration of the OIS. Test takers are asked to indicate what activities they prefer to do. This style of questioning saves the instrument from measuring the socialization of the test takers or the opportunities they may have had to experience different activities and thus seems fairer to both sexes.

THE SELF-DIRECTED SEARCH

The SDS is a "self-administered, self-scored, and self-interpreted vocational counseling tool [Holland, 1972, p. 3]." It is very dissimilar to the vocational interest surveys previously examined, in that it measures competencies as well as interests and can be taken and scored without benefit of counselor.

Recently Pirtle (1974) has suggested several areas of possible sex bias in the SDS. Her criticisms focus on the sex bias conveyed in the occupational titles of the Occupations Finder and in the activities presented under the categories "Realistic" and "Conventional" of the test booklet. Her comments on the occupational titles follows the assumption that any occupation with the suffix *-man* (e.g., mailman) may convey a vocationally off-limits message to women test takers. She also suggests that a major source of sex bias lies in the SDS itself.

The activities listed under the "Realistic" heading are those to which many males have been exposed in shop courses in high schools, activities to which females have had only limited exposure. As the directions on an earlier form of the SDS require that the activities not be counted if they are "disliked" or if they have "never been done" by the examinee, it would appear that the scores for males and females could be based on two separate standards of experience. Males could have been exposed to wood- or metalworking, have decided that they do not enjoy this activity, and mark their SDS accordingly. Females, faced with the same directions, may never have experienced the activity and therefore would be forced to respond in the same manner as the males. Low scores on the "Realistic" category for males and females would not then be a function of identical reactions to the same type of activities. The SDS is undergoing alteration in its directions that may reduce some of these difficulties.

In a reverse manner, the same results could occur for males and females in their responses to activities listed under the "Conventional" category, which are mostly clerical or clerically related. Many females and few males have had experience with secretarial jobs. Therefore the basis for receiving a low score on the "Conventional" category also could come from different experiences, not from the same reaction to an identical experience.

Holland (1974) has recently responded to the question of systematic bias in the delivery of vocational services. Although his article did not

address Pirtle's comments, several of his points seem relevant:

> The key assumption . . . is that a general perspective of bias will be more helpful for everyone (consumers, practitioners, developers and publishers) than a continuation of instrument-specific discussions or assessments of test bias based on personal opinion [p. 210].

In many ways his position appears cogent. Empirical evidence of systematic bias is indeed much more useful than a mere proliferation of opinion. Additionally, Holland and his associates have attempted to examine the SDS for the possibility of sex bias. Zener and Schnuelle (1972) found that the SDS did significantly expand the career options considered by both males and females, but essentially within the same categories. Holland does not, however, report any specific studies designed to test Pirtle's charges. Holland's preference for empirical testing of the possibility of sex bias in instruments is a bit confusing in the light of his own armchair evaluations of the OIS, SVIB, and SDS (1974). Nonetheless, his general point is quite reasonable. Indeed, this present paper would have been much easier to draw together if such data did exist. Unfortunately, or perhaps revealingly, it does not.

Holland (1974) also expresses the position that vocational information services may be receiving too much credit (blame?) for their role in perpetuating the socialization processes that affect the career choices of both men and women. Perhaps his disclaimer is well taken. Surely the sex-role stereotyping an average 20-year-old has experienced via schoolbooks (Weitzman & Bustamante, 1972), children's readers (Frasher & Walker, 1972; Key, 1971; Weitzman, Eifler, Hokada, & Ross, 1973), instructional materials and literature (Grambs, 1972), and even occupational information (Birk, Cooper, & Tanney, 1973), will not be instantly undone by unbiased vocational service. Difficult as this task might be, however, any vocational service can continue the tradition of sex bias by abandoning responsibility, or by proclaiming that it is only measuring or encouraging an individual to utilize the experiences accrued through his or her socialization, even though that socialization may have been sex-role stereotyped. To dismiss the effects of socialization on career choice seems at best naive, and at worst an admission that the occupational status quo is an acceptable state for all human beings.

This occupational status quo may be acceptable for males. For females, the vocational opportunities may be a bit more limited. As vocational measures are designed, at least partially, to facilitate one's entry into a satisfying career, what is the current situation women are experiencing?

Bergman (1973) reviews the contemporary economic position of women: (1) Women's unemployment is 35 percent above men's and the male-female unemployment differential is getting worse. (2) Women's earnings are 50 percent of men's, and the trend in the relation of women's to men's wages is downward. (3) There has been virtually no progress in breaking down occupational segregation despite five years of campaigning by the women's movement. (4) Millions of women who live in households without men are in dire material need.

She elaborates on the reasons behind these rather dismal statistics:

> The major reality behind the inferior and worsening relative position of women in the labor market is the persistence of employers' notions about which kinds of jobs are "women's work" and which kinds of jobs are "men's work." The direct result is an extreme degree of occupational segregation; currently about 70 percent of women work in occupations in which women predominate, or are overrepresented, and about 70 percent of men work in occupations in which men predominate. Every dicennial census since 1890 has shown a rise in the proportion of women who are in the labor force, yet the notions of most employers about what kinds of jobs are appropriate for women have changed hardly at all. In 1890 women were "in their place" in clerical jobs, in elementary teaching, in nursing, in light factory work, as retail sales clerks, in domestic work. The same list is appropriate today although since 1890 women's labor force participation has grown from 18 percent to 44 percent and women have gone from 17 percent of the total labor force to 37 percent. Despite some expansion in demand within some women's fields, the inevitable result has been the overcrowding of those relatively few jobs in which women are unreservedly acceptable.
>
> Of course, many women have also considered it natural to be confined to "women's jobs," and act accordingly, but increasingly many women do not have these inhibitions and the major resistance to change has been on the part of employers. If the bars come down to women's full participation in all kinds of jobs, most women would be delighted.

> Overcrowding in the few "women's" occupations translates into lower wages and higher unemployment rates for women. The demand for women's labor is kept artificially low because of their virtual exclusion from certain fields —medicine, law, engineering; dentistry, supervisory and executive positions, the crafts—and the supply of women to the few fields where they are welcomed is artificially increased [pp. 1-2].

With this type of bias confronting women in the working world, it seems all the more urgent to expunge whatever sex-role-stereotyped messages they may be receiving through vocational information or interest measures.

SUMMARY, CONCLUSIONS, HYPOTHESES, AND THE NEED FOR FURTHER RESEARCH

In evaluating the SCII, OIS, and SDS, it seems apparent that the constructors of these instruments are making alterations to express the fact that no occupations are ipso facto reserved to one sex alone. Assuming the applicability of this suggestion, particularly to women, no effort that test constructors can make to improve linguistic or verbal communications with test takers seems unreasonable to expect. Therefore it appears logical to suggest that any manifestations of gender appropriateness (in the items, in the profiles) be expunged.

Additionally it appears relevant to attempt to measure what interest inventories communicate to those who take them. Holland (1974) has suggested several ways to detect systematic bias in the delivery of vocational services. He has also outlined numerous areas where research into vocational behavior is needed. In summary, he suggests research through evaluative studies to develop a clearer knowledge of how vocational inventories and their revisions, as well as other interventions, affect people; theoretical and substantive studies to develop a better knowledge of vocational aspirations—especially to determine the potent influences at the younger age levels; longitudinal studies of persons who have made the transition from female- to male-dominated jobs or vice versa; comparison studies of men and women holding the same jobs; studies comparing the current theories of careers as they apply to men and women in the same occupation; experimental tests of various types of training materials used to identify women with skilled trades talents; followup studies of school systems with no restrictions on course selection, in order to evaluate their effect on the heterogeneity of vocational aspirations; measurement of the effect of parents without narrow role preferences on their children's vocational choices; study of communities that offer a variety of nondiscriminatory part-time work activities for boys and girls, and measurement of the effect of these experiences on the vocational aspirations of the children; and assessment of the influence of current nonbiased brochures and auxiliary materials on current interventions. To this list perhaps should be added studies that would assess whether the phrases currently used to assess interests do bias the replies of women or men (e.g., do they respond differently to requests for activities they "dislike" than they do to requests for activities they "never have done"?).

APA AND NVGA TEST STANDARDS

In attempting to ascertain how the American Psychological Association and the National Vocational Guidance Association test standards might apply to the determination of overt sex bias in career interest inventories and their components, the APA *Standards for Educational and Psychological Tests* (1974) and the *National Vocational Guidance Association Newsletter* (1973) were reviewed. Ironically, from the perspective of this paper, both documents used the pronoun *he* when referring to the test developer or user. The APA standards used both *he/she* only when referring to the test taker.

The guidelines can be extrapolated to interest measurement. The NVGA guidelines recognize that deprivation with respect to certain aspects of human development can retard development in other areas. Although the NVGA document does not elaborate on the types of deprivation that can occur, it seems reasonable to infer that the gender-limiting activities frequently experienced by women and men may well affect their ability to make adequate occupational choices. Test developers need to recognize this fact in

designing their instruments. One NVGA guideline seems particularly relevant:

> The nature of guidance for career development . . . may include career guidance materials which insure that each individual considers the possible and even predictable value changes in society which could affect a person's life [p. 6].

Adhering to this guideline could insure proactive measures to make possible the entry of women into atypical careers. Perhaps much of the anguish and waste of real human potential (Bergman, 1973) would be avoided by following both the spirit and the letter of this dictum.

The APA *Standards for Educational and Psychological Tests* appear to offer several clear measures for the identification of overt sex bias in career interest inventories or their components.

Standard A1.1 states:

> If information needed to support interpretations suggested in the manual cannot be presented at the time the manual is published, the manual should satisfy the intent of standard A1 by pointing out the absence and importance of this information. Essential

As has been repeatedly stressed in this paper, the impact of gender-linked terms on the responses of test takers has not been explicitly measured. This standard would seem to make it incumbent on test constructors to include this information in their manuals.

Standard A3 also seems relevant to the issue of the necessity for insuring against sex bias. It stresses the need to frequently renorm tests, an issue quite relevant to the measure of women's vocational interests:

> The test and its manual should be revised at appropriate intervals. The time for revision has arrived whenever changing conditions of use or new research data make any statements in the manual incorrect or misleading. Very Desirable

Standard B1.2 also appears to caution test constructors to be vigilant and explicit in warning test users of sex bias in the reporting of scores:

> The manual should draw the user's attention to data that especially need to be taken into account in the interpretation of test scores. Very Desirable.

Standard B1.3 is even more explicit in insisting that test constructors and users be watchful for items (e.g., certain sex-linked experiences?) that may artificially influence scores:

> The manual should call attention to marked influences on test scores known to be associated with region, socioeconomic status, race, creed, color, national origin, or sex. Essential

Standard E7.41 reiterates the need for frequent renorming of criterion groups:

> Validation reports should be clearly dated, with the time interval given during which the data were collected. Essential

The additional comment (included in the *Standards)* on this standard stresses its appropriateness to the area of interest measurement of women where—

> Validity [of the test] may deteriorate over time; in employment testing, for example, changes in jobs, work aids, and in the ability levels of applicant populations tend to change the circumstances in which validity information is developed.

Perhaps the most telling suggestion in the list of standards is E9, which requests that all aspects of bias be investigated—a clear charge of responsibility to test constructors and users:

> A test user should investigate the possibility of bias in tests or in test items. Wherever possible, there should be an investigation of possible differences in criterion-related validity for ethnic, sex, or other subsamples that can be identified when the test is given. The manual or research report should give the results for each subsample separately or report that no differences were found. Essential

Standard E12.2 states:

> Test content should be examined for possible bias. Essential

This is further explained in the *Standards* by the comment:

> Bias may exist where items do not represent comparable tasks and therefore do not sample a common performance domain for the various subgroups.

Pirtle's (1974) comments regarding the possible bias in the SDS seem to fall within the domain of this standard.

Standard G4 further demands sensitivity on the part of test users to possible allegations of bias:

> Test users should seek to avoid bias in test selection, administration, and interpretation; they should try to avoid even the appearance of discriminatory practice.

Regarding the selection of items to measure interests, standard J1.1 (Essential) reminds test users to—

> . . . consider the total context of testing in interpreting an obtained score before making any decisions (including the decision to accept the score).

The comment that follows this guideline cautions test users to be aware that test scores may well be influenced by the effects of early learning and the male and female sex-role stereotyping that commonly takes place.

SUMMARY

In this paper an attempt was made to search the literature for studies that would indicate whether or not sex-role stereotyping (via language) has been examined for its impact on people who take interest measures. A careful scrutiny revealed no empirical data to evaluate the hypothesis that the linguistic structure of items does or does not influence results on career interest inventories. Conclusions drawn from other fields (applied sociolinguistics, social psychology, clinical psychology) strongly support the need for the linguistic aspect of inventories to be examined in a series of studies. The APA and NVGA guidelines for the construction of tests and for career information materials, respectively, also support the need for such a series of studies in the interest of insuring unbiased tests.

REFERENCES

American Psychological Association, *Standards for educational and psychological tests*. Washington: Author, 1974.

Bem, S. L., & Bem, D. J. Sex segregated want ads: Do they discourage female job applicants? In J. H. Hamsher and H. Sigal (Eds.), *Psychology and social issues*. New York: Macmillan, 1973. Pp. 261-265.

Bergman, B. R. A policy agenda for women's economic problems. Paper presented at hearings of the Joint Economic Committee on the Economic Problems of Women, 1973.

Birk, J. M., Banbanel, L., Brooks, L., Herman, M., Juhasz, J., Seltzer, R., & Tangri, S. S. A content analysis of sexual bias in commonly used psychology textbooks. Unpublished APA Task Force report, 1973.

Birk, J. M., Cooper, J., & Tanney, M. F. Racial and sex-role stereotyping in career information illustrations. Paper presented at American Psychological Association annual convention, Montreal, 1973.

Campbell, D. P. Reaction to Schlossberg and Goodman's "imperative for change." *Impact*, 1972, 2, 29-31.

Campbell, D. P. Layout of the new Strong profile. Paper presented at symposium on interest measurement, American Psychological Association, 1973.

Campbell, D. P. *Strong Vocational Interest Blank: Manual for the Strong-Campbell Interest Inventory*. Stanford, Calif.: Stanford University Press, 1974.

Constantinople, A. Masculinity-feminity: An end to a famous dictum? *Psychological Bulletin*, 1973, 80, 389-407.

Cronbach, L. J. *Essentials of psychological testing*. New York: Harper & Row, 1970.

Diamond, E. E. The Masculinity-Feminity scale in interest measurement: An idea whose time has passed. Paper presented at American Psychological Association annual convention, Honolulu, 1972.

Farb, P. *Word play*. New York: Knopf, 1974.

Frasher, R., & Walker, A. Sex roles in early reading textbooks. *Reading Teacher*, 1972, 25, 741-749.

Grambs, J. D. Sex stereotypes in instructional materials, literature and language: A survey of research. *Women Studies Abstracts*, 1972, 1, 91-94.

Holland, J. L. *Professional Manual for the Self-Directed Search*. Palo Alto, Calif.: Consulting Psychologists Press, 1972.

Holland, J. L. Some guidelines for reducing systematic biases in the delivery of vocational services. *Measurement and Evaluation in Guidance*, 1974, 6, 210-218.

Huth, C. M. Measuring women's interests: How useful? *Personnel and Guidance Journal*, 1973, 51, 539-545. (a)

Huth, C. M. Reply to Campbell. *Personnel and Guidance Journal*, 1973, 51, 697. (b)

Key, M. R. The role of male and female in children's books: Dispelling all doubt. *Wilson Library Bulletin*, 1971, 46, 167-176.

Kuder, G. F. Some principles of interest measures. *Educational and Psychological Measurement*, 1970, 30, 205-226.

Kuder, G. F. *General Manual, Kuder Occupational Interest Survey, Form DD*. Chicago: Science Research Associates, 1971.

National Vocational Guidance Association. Career development and career guidance. *National Vocational Guidance Association Newsletter*, 1973, 13, 5-8.

Pirtle, C. Report on possible sex bias in the Holland Self-Directed Suicide. Unpublished manuscript, Iowa State University, 1974.

Schlossberg, N., & Goodman, J. Imperative for change: Counselor use of the Strong Vocational Interest Blanks. *Impact*, 1972, 2, 25-29.

Schneider, J. W., & Hacker, S. L. Sex-role imagery and the use of the generic "man" in introductory texts: A case in the sociology of sociology. *American Sociologist*, 1973, 8, 12-18.

Scott, Foresman and Company. *Guidelines for improving the image of women in textbooks*. Glenview, Ill.: Author, undated.

Strong, E. K., Jr. Good and poor interest items. *Journal of Applied Psychology*, 1962, 46, 269-275.

Tittle, C. K. Sex bias in educational measurement: Fact or fiction? *Measurement and Evaluation in Guidance*, 1974, 6, 219-266. (a)

Tittle, C. K. *Women and educational testing: A selective review of the research literature and testing practices.* Princeton, N.J.: Educational Testing Service, 1974. (b)

U.S. Department of Commerce, Bureau of the Census. *We, the American women.* Washington: Government Printing Office, 1973.

Webb, E. J., Campbell, D. P., Schwartz, R. D., & Sechrest, L. *Unobtrusive measures: Nonreactive research in the social sciences.* Chicago: Rand McNally, 1966.

Weitzman, L. J., & Bustamante, D. Sex role stereotyping in textbooks. Presented at National Education Association Conference on Sex Role Stereotypes, Arlie, Va., 1972.

Weitzman, L. J., Eifler, D., Hokada, E., & Ross, C. Sex-role socialization in picture books for pre-school children. *American Journal of Sociology*, 1973, 77, 1125-1150.

Zener, T. B., & Schnuelle, L. An evaluation of the Self-Directed Search. (Report No. 124) Baltimore: Center for Social Organization of Schools, Johns Hopkins University, 1972.

Reducing Sex Bias: Factors Affecting the Client's View of the Use of Career Interest Inventories /6

Janice M. Birk
UNIVERSITY OF MARYLAND

ACKNOWLEDGMENT

The author is grateful to Ms. Jackie Cooper for her research assistance in the preparation of this manuscript.

ABSTRACT

Although interest inventories represent only one form of input to the total career-counseling process, their usage can be viewed as particularly significant because inventory results typically suggest the occupational areas that are explored in counseling sessions. Research indicates that the options generated by the inventories include and exclude specific career considerations for either sex. This situation defines a complex issue, since many factors interact with interest inventory results—stereotyped attitudes of the counselor and of the client, for example, and those reflected in inventory manuals and interpretive materials.

The author has comprehensively reviewed the literature for research and conceptual papers that relate to the client's view of the use of interest inventories in the career-exploration process.

The review was organized around three major areas: the administration of interest inventories, the interpretation of results, and counselor and client perceptions of interest inventory results. As a result of the review, the author suggests several changes for interest inventory manuals and interpretive materials to maximize the counselor's effective use of interest inventories on the client's behalf.

INTRODUCTION

Job titles may differ, but a primary function of many counselors is to facilitate the career decisionmaking of clients. In a large university counseling center, for example, Crites (1969) reported that 23 percent of the clientele had vocational concerns and another 28 percent had vocational-educational problems. Similarly, according to Magoon (1973), university and college counseling centers participating in a comprehensive data-retrieval system reported that during 1972-1973 the median percentages of clients seeking educational-vocational counseling in large institutions (more than 10,000 students) and small institutions (fewer than 10,000 students) were 40 percent and 30 percent respectively. For the employment service counselor, helping young adults to prepare for satisfying employment was emphasized several years ago by Hedges (1964), along with her then avant-garde injunction that counselors must respond to the special challenge of overcoming obstacles that limit women to "traditional" occupations.

The fact that employed women are more restricted than men to low-status and low-salary careers is indisputable (U.S. Department of Labor, 1971); that men suffer their own kind of job discrimination is also clear. The etiology and maintenance of this condition is as complex as it is unacceptable. With the advent of affirmative action, however, the status quo is being challenged and the promise of change exists.

A current report of the U.S. Department of Labor (1973) projected the needs of the labor market through the seventies. Projections were made in order to help women make realistic plans for those careers that offer employment opportunities and, therefore, advancement possibilities. To become competitive, "women and girls should plan to train for nontraditional as well as traditional occupations [p. 1]," since the usual "women's" occupations will not have sufficient openings for women seeking work.

The counselor, involved in career exploration with clients, fosters consideration of an array of career options. If the process, or any part of it, eliminates options on the basis of an irrelevant variable such as race, sex, or marital status, then it is biased. A brief discussion of the relevancy of sex to the world of work is provided by Harmon (1973, p. 496).

Increasingly, counselors are enjoined to abandon sex-role stereotyping and thus expand women's career options (Angrist, 1972; Eyde, 1970; Hall, 1973; Pringle, 1971). Presumably, few counselors of either sex describe themselves as chauvinistic or sexist (Pietrofesa & Schlossberg, 1971); therefore it is likely that most counselors would not recognize the possible bias in career counseling in terms of interactions, content, and materials used. Although not excusable, this is understandable, since many of the influences militating against nonstereotypic career choices are subtle and elusive. For example, a detailed examination of over 2,000 illustrations in popular sources of career information (such as the *Occupational Outlook Handbook*, the *Encyclopedia of Careers*, the *SRA Occupational Briefs*, and assorted brochures) revealed that (1) women and members of ethnic minorities are severely underrepresented, (2) Asian Americans are typically pictured in laboratories, (3) women are depicted as smiling while men appear to be absorbed in the serious business of work, and (4) women are seldom pictured outdoors or involved in activity, but are frequently pictured as the career representatives for service occupations (Birk, Cooper, & Tanney, 1973). Although a content analysis of racial or sex-role stereotyping in the textual matter of career information has not been done to date, such a study seems needed, as well as likely to appear. Until recently, however, researchers have not attended to issues of sexual or racial bias in counseling materials and processes.

In a discussion of the role of tests in career exploration, Prediger (1972) proposed that the tests should (1) stimulate, broaden, and focus career exploration, (2) stimulate exploration of self in relation to careers, and (3) provide predictive information relative to different career-choice options. Holland (1974), looking at vocational services in general, stated that an ideal vocational service, among other things, should provide an experience that is effective for the client and should provide the client with the full range of vocational options. The question arises whether interest inventories in general accomplish for women the broadening and effective

experiences suggested by Prediger and Holland. Many critics, among them Angrist (1972), Harmon (1973), Huth (1973), Johnson (1970), Schlossberg and Goodman (1972a), and Tittle (1974), believe that interest inventories in their present form and usage do not provide such experiences for women.

Research and documents relevant to the issues of sex bias in the use of interest inventories will be reviewed in the following pages. The specific focus of the review will be factors that affect the client's view of the career-exploration process in which interest inventories are used. These biasing factors are found in the administration of interest inventories, in manuals and instructions, in the interpretation of inventory results through published materials, and in the counselor's perception of results. Recommendations will be presented that have relevance for the entire system of career exploration, since the measurement and interpretation of interest patterns constitutes a significant portion of the career-exploration process (Munley, Fretz, & Mills, 1973; Whitney, 1969).

THE ADMINISTRATION OF INTEREST INVENTORIES

INTEREST INVENTORY MANUALS

Starting from the earliest phase of interest inventory administration, one can reasonably assume that the test administrator becomes familiar with the instrument through the appropriate manual. Manuals typically provide a general description of the instrument, guidelines for use, and psychometric data relevant to scale construction and validation. Presumably the test administrator consults the manual for guidelines for administering the inventory in standardized form and for interpreting results to test takers.

Two of the major interest inventories have just undergone revision. Comprehensive revision of the Strong Vocational Interest Blank (SVIB) includes modifications in the inventory's manual and profile as well as a change to one form for both sexes. The revised version of the SVIB is the Strong-Campbell Interest Inventory (SCII). Also revised are the *Interpretive Leaflet* of the Kuder DD Occupational Interest Survey (OIS)—which now gives scores on all scales to both sexes—and the interpretive section of the Kuder General Interest Survey (Form E) manual. Since the older SVIB manual (1966) is likely to be in use for some time and the earlier OIS *Interpretive Leaflet* (1970)—though unavailable as of May 1974—may still be in the possession of some users, an examination of their content is appropriate. The subsequent revisions, now available, represent a significant effort toward needed improvement.

The Strong Vocational Interest Blanks. Schlossberg and Goodman (1972a) believe that the current manual and handbook for the SVIB contain guidelines that could be harmful to women clients. They refer specifically to a passage in the manual:

> Many young women do not appear to have strong occupational interests, and they may score high only in certain "premarital" occupations: elementary school teacher, office worker, stenographer, secretary. Such a finding is disappointing to many college women . . . . In such cases, the selection of an area of training or an occupation should probably be based on practical considerations—fields that can be pursued part-time, are easily resumed after periods of non-employment, and are readily available in different locales [Campbell, 1966, p. 13].

Schlossberg and Goodman also refer to a section of the handbook:

> There is nothing in these data to suggest that the relationship between women's interests and occupational characteristics is any different from that found among men. Yet, occupational planning for young women will necessarily be different from that done by young men because of their different roles. How to integrate these matters of interests into the realities of a young wife and mother's life is not well understood, but, as the strategies of planning must be supplemented somehow, these scales should provide some systematic data to help direct the feminine decision [Campbell, 1971, pp. 191, 193].

Although Schlossberg and Goodman did not specify the way in which the passages could have deleterious effects on women, it seems clear from the content that options for women are considered to be limited and that the status quo regarding women's traditional roles is acceptable.

For those unfamiliar with the SVIB, the manual provides several case studies to reflect different profiles and counseling situations. Four of the five cases are men; the career areas they are considering are architecture, political science, and technology. The woman, initially interested in nursing, changed to the field of merchandising. In the assessment process it was noted that "her social poise and tasteful grooming were definite assets [p. 17]." The section on case studies thus perpetuates stereotypic attitudes toward occupational roles as well as the significance of physical appearance for women. Case studies based on stereotypic roles and attitudes are grossly inconsistent with the spirit of providing clients with a full range of vocational options. Also, since nearly half the labor force is made up of women, more case studies of women would be appropriate.

A reader of the 1969 supplement to the manual could easily forget that a women's form of the SVIB exists. The manual supplement is clearly focused more on the men's form than on the women's. A reader might reasonably wonder if the assessment of women's interests is considered of minor significance, in view of the following observations:

1. The opening sentence is: "Men in different jobs have different interests." If the manual supplement is truly designed to bring the 1966 manual "up to date with information covering the 1968-69 revisions in *both the men's and women's forms,*" as stated in the Foreword (emphasis supplied), then it would be more appropriate to state: "*People* in different jobs have different interests." This could be challenged as trivial, except that the opening sentence seems to reflect the focus of the entire supplement.

2. The masculine pronoun is consistently used throughout the manual supplement. Although the research is scanty at present, there is some suggestion that use of the symbol *man* may lead many readers to think male, not male and female (Schneider & Hacker, 1973). Use of the masculine pronoun leads to particular confusion in the section entitled "The Occupational Scales." Although both the men's and women's forms have occupational scales, the construction and development of these scales is described in terms of Men-in-General and the men's Army Officer scale. Parenthetically Campbell notes that the women's occupational scales were developed analogously.

3. Description of the men's nonoccupational scales covers one and a half pages; that of the women's, approximately two-thirds of a page. No explanation is offered as to why the Age Related, Managerial Orientation, Occupational Level, and Specialization Level scales are not part of the women's form.

4. Regarding the Masculinity-Femininity scale, Campbell offers an explanation that can be conveyed to men who feel that a low MF score reflects a lack of virility. There is no comparable explanation offered for women who may score low on the FM scale, as if to say that it's all right if women mistakenly interpret that score to mean they are "masculine," but it's important to insure that men don't mistakenly interpret the score to mean they are "feminine." (From Constantinople's [1973] review of literature pertaining to masculinity-feminity scales, the controversial nature of this construct is clear. The elimination of the MF scale in the revised SVIB suggests that measurement of masculinity-feminity as a concept is undergoing change.)

5. The sole example provided to demonstrate the use of the SVIB profile is that of a high school boy in relation to scores on the Science and Mathematics scales.

In light of the above, Campbell's concluding comments seem somewhat ironic. He relates use of the SVIB to "understanding the person as a unique individual. Clients and applicants are real people . . . [p. 23]." The reading of the manual supplement suggests, instead, that SVIB users and takers are males, or that only the male test users and takers are worth discussing. If that is not an accurate representation of the spirit of the manual supplement, then corrective measures must be taken in order to correct misperceptions by readers. For example, case studies of boys and girls or men and women with nonstereotypic roles and attitudes might stimulate the reader to think of careers with a more open mind. A significant change would be discontinuation of the generic term

man and the masculine pronoun and substitution of *people, persons,* and the like to refer to individuals in general. The ramifications of the present use of language in written matter have been discussed by Schneider and Hacker (1973) and others who have additionally provided writing guidelines to counter misrepresentations of women in literature (APA, 1973; Scott, Foresman & Co., undated). In view of the 1974 revision of the SVIB and its noteworthy effort to provide an improved unisex inventory, it is highly desirable that the companion manual reflect the importance of wide options and nonbiased indices of career suitability for both sexes.

The Kuder Occupational Interest Survey. The Kuder OIS is another interest inventory popularly used by counselors. An examination of its manual (Kuder, 1971) reveals that, as in the SVIB manual, the masculine pronoun is employed throughout, so that consistently counselors are men and persons using the inventory appear to be boys and men.

What is most striking in the manual, perhaps, is the elimination of women's occupational and college major scales from the men's profile (p. 10), in contrast to the women's profile, which has rankings from both men's and women's occupational scales and college major scales. Kuder notes that "a study of scores for women on scales developed on male subjects indicates that a number of these scales can be useful in the guidance of women . . . . Scores reported for women include scores on 28 scales developed on male subjects [pp. 1, 2]." Why is the converse not true—that scores for men developed on women's scales might be useful in the guidance of men? It may be that the former is empirically validated while the latter is not. In that case, acknowledgment could be made that men might appropriately consider "female" careers although the usefulness of the OIS women's scales for that purpose has not yet been empirically tested. Perhaps the difference in the reporting of scores is not one of empirical testing at all but, rather, is based on the "given" that a man can enter any field he chooses. This seems to be a plausible explanation, since male-normed scales were selected for reporting on the women's profile if they represented "fields in which there are opportunities for women [p. 25]."

The implication drawn from the current manual is a regrettable acceptance of the status quo, with a message to the reader that "what is, will be": where women have career opportunities today is where they are likely to have career opportunities tomorrow. Fortunately, however, in the revision of the OIS, scores are reported to both sexes on all scales. This fact is reflected in the revised *Interpretive Leaflet* (1974) and the sample profiles it contains.

The Self-Directed Search. Although Holland (1972) has defined the SDS as a "vocational counseling tool [p. 3]," references throughout the manual suggest that he considers it to be appropriately included among interest inventories. As with the SVIB and OIS manuals, the SDS manual seems primarily focused on male test users and takers because of the use of the masculine pronouns to refer to counselors, students, and people in general. In the one instance where a woman is specifically identified, she is associated with a feminine interest area: "This girl wanted to be a musician [p. 8]."

A section of the manual, "Effects and Biases," attempts to justify the bias of the SDS with the observation that "the SDS is equally biased for and against women and for and against men. Men tend to get R, I, and E codes most frequently . . . . At the same time, there is a tendency for the items in the R, I, E scales to discriminate more efficiently for men while the A, S, C items tend to discriminate more efficiently for women [p. 18]." The justification seems to be based on the assumption that two wrongs make a right; it tends to discount the claim that "the SDS fosters the interests of women and other targets of discrimination [p. 18]," and it implies an acceptance of the status quo.

The Minnesota Vocational Interest Inventory. According to Clark and Campbell (1965), the MVII was prepared to "provide systematic information on the interest patterns of men in nonprofessional occupations [p. 7]." Scores from the MVII indicate similarity between the test takers' interests and those of men in nonprofessional occupations at the skilled and semiskilled levels. Since there is no mention what-

soever of women, or use of the MVII with women, it seems clear from the manual that the MVII is intended to be administered to boys and men only. By implication, then, the array of occupations included in this inventory—printer, carpenter, plumber, electrician, and the like—are not to be seriously considered by women. Even if a counselor should choose to use the MVII with girls and women, the manual provides no guidelines for the interpretation of women's scores based on male norm groups.

Summary. From among the several interest inventories available to counselors, the manuals of four instruments were closely examined. Since counselors must necessarily refer to manuals to obtain norming information and guidelines for interpretation of scores, the manuals represent an influence in the career-exploration process. In varying degrees, they contain both explicit suggestions and subtle implications which, if followed by the counselor, could have deleterious effects on women clientele. Recommended changes in the manuals include (1) a writing style that does not bias in favor of the masculine, such as that elucidated in the guidelines published by Scott, Foresman and Company (undated) or the APA (1974); (2) the use of case studies that represent men and women equally and portray men and women in nonstereotypic roles; (3) a definitive statement that attests to the right of all clients to be exposed to the full range of career options, thereby challenging the status quo; and (4) in cases where an inventory limits the options available to clients, an acknowledgment of this shortcoming and the offering of suggestions to circumvent the limitation.

INTEREST INVENTORY INSTRUCTIONS

Except for the SVIB, which still makes available separate forms for men and women (the revised SVIB-SCII has one form for both sexes), the interest inventories described present the same test booklet and answer sheet to men and women. Thus the instructions are the same for all who use the inventories.

As part of completing the SDS, students are requested to list their occupational daydreams; later they are instructed to compare codes of the occupational daydreams with the summary codes of the SDS. The two sets of codes are expected to be similar; if they are not, the student is encouraged to discuss the differences with a counselor. The assumption seems to be that the summary code is the norm the daydream code should match. It is feasible that a man or woman with nonstereotyped occupational daydreams may have discrepant codes. Since the manual provides no guidelines for the counselor who must deal with discrepant codes and since men tend to get R (Realistic), I (Investigative), and E (Enterprising) codes most frequently, whereas women most frequently get A (Artistic), S (Social), and C (Conventional) codes (Holland, 1972), it is possible that the counselor may assume that the summary code is the more accurate and thus encourage exploration of the stereotyped occupations. A clarifying statement in the SDS booklet for the students, as well as a section in the manual for the counselor, seems necessary to avoid possible errors in interpretation.

From a review of the studies using the SVIB for Women (SVIB-W) over the past 10 years, Huth (1973) concluded that it's not likely to be of use in most counseling situations with women because it is unable to differentiate the interests of most women, who are homemakers and nonprofessionals. That conclusion was originally drawn by Super and Crites (1962), and various attempts have since been made to broaden the array of career options produced by SVIB scores, most notably by changing the test-taking instructions and administering both the men's and women's forms to an individual.

An early study involving the manipulation of test instructions was that of McCarthy and McCall (1962). The subjects, 20 nuns in elementary teaching and 20 candidates for the sisterhood who were also interested in teaching, first took the SVIB-W under standard instructions. One hour later they retook the inventory under instructions to pretend they were "hard-boiled males." Results showed a reversal in interests, with a rejection of the elementary teaching role for the professions of medicine and law. Somewhat similarly, Sparks (1967) administered the

SVIB-W to 44 high school girls with standard instructions and then with role-playing instructions: "Pretend you are boys . . . you have the same freedom to plan a career as a boy." Results showed a significant decrement on the Elementary School Teacher scale and substantial increments on the Lawyer and Engineer scales.

Most recently Farmer and Bohn (1970) administered the SVIB-W to 25 married and 25 single women under two conditions: first with standard instructions, and then with instructions intended to reduce the home-career conflict. The women were to pretend that men have come of age and that (1) men like intelligent women, (2) men and women are promoted equally in business and in professions, and (3) raising a family is very possible for a career woman. Results indicated that when the women followed the conflict-reducing instructions, scores on career scales significantly increased (Author, Artist, Psychologist, Lawyer, Physician, and Life Insurance Saleswoman) and scores on homemaker scales significantly decreased (Buyer, Business Education Teacher, Secretary, Office Worker, Elementary School Teacher, Housewife, Home Economics Teacher, and Dietician). Farmer and Bohn concluded that for both married and single women career interests would be raised if the home-career conflict were reduced. Their findings and those of Sparks and of McCarthy and McCall suggest that inventory patterns will change if attitudinal response sets are changed.

In a later commentary Farmer (1971) suggested that the answer to reducing the home-career conflict lies in the combination of home and career rather than in the exclusion of one for the other. Relatedly, Karmon (1973) observed, from a study designed to explore the psychological and sociological characteristics of college women in both stereotypic masculine occupations and stereotypic feminine occupations, that "women perceive a narrow range of career possibilities because they are fearful of venturing into a man's world, frequently doubting their capacity to fill masculine-typed positions [p. 12]." If counselors accept that a basic conflict does in fact exist, then they can help women reexamine old myths regarding women and the world of work, sort values, arrange priorities, consider alternatives, make decisions, and implement a choice (Schlossberg, 1972). Responding to Huth's (1973) comments about the career-versus-homemaker comparison, Campbell (1973) dismissed the distinction as one that is not useful in working with research data. That may be true, but from the counselor's viewpoint research that highlights a dimension of career conflict (such as Farmer & Bohn, 1970; Karmon, 1973; McCarthy & McCall, 1962; Sparks, 1967) could stimulate explorations in the career-counseling process that are very effective and expansive for the woman client.

The second suggestion to maximize the number of interest areas a woman can consider from SVIB scores is to administer both the men's and women's forms (Cook, 1971; Laime & Zytowski, 1963; Munley, Fretz, & Mills, 1973; Schlossberg & Goodman, 1972a; Stanfiel, 1970). The observations of Schlossberg and Goodman (1972a), after administering both forms to 28 men and women, were instrumental in their presentation of a resolution to the American Personnel and Guidance Association to request revision of the SVIB in order to reduce discrimination. In their pilot study they found that—

> . . . nine women scored high on the occupation physician on the men's form, and only four on the women's form. Had the women, as is usual, taken only the women's form, five of them would not have had the opportunity to consider medicine as a career through the use of the SVIB. In this same pilot study, nine women scored high on the occupation psychiatrist and ten on the occupation of advertising, neither of which is available on the women's form. Of the ten men taking the women's form, seven scored high on the occupation guidance counselor, six on recreation leader, and five on speech pathologist, none of which are available on the men's form [p. 27].

In a more rigorously designed study, Munley, Fretz, and Mills (1973) reached conclusions similar to those of Schlossberg and Goodman (1972a): that administering the men's form to women in addition to the women's form has some advantages. They administered the men's and women's forms of the SVIB to 90 undergraduate women. Results supported the findings of earlier studies (Laime & Zytowski, 1963; Stanfiel, 1970). Significantly higher means were obtained on the men's blank scales for 13 of the 21 scales common to the men's and women's blanks, as well as a mean of over five B+ and A ratings on

scales unique to the men's form. The authors concluded that if a counselor uses only the women's form, occupational areas in which the client's interests are similar to those of men may be overlooked. Also, a woman client may mistakenly believe that she has interests dissimilar to those of people in a given occupation when in fact she lacks interests in common with the female norm for that occupation. The authors recommended "administration of both forms of the SVIB to college women requesting vocational counseling. Only if such a practice is adopted will college female clients be assured a complete picture of their interests [p. 289]."

The recommendation to use both forms of the SVIB does not seem either feasible or economical in terms of time or expense. Furthermore, results and implications of a study by Johansson and Harmon (1972) suggest that, if followed, such a recommendation could lead to erroneous interpretations. Since the development of the SVIB did not control for sexually stereotypic differences, a possible result from taking the form for the opposite sex may be depressed scores on a given scale because the test taker rejected the sexually stereotypic items. The authors concluded that thereby the obtained scores "are largely uninterpretable. If they are used, they should be interpreted with sexual stereotypes, and their potential effect on scores, in mind [p. 409]." To avoid sexual bias in the SVIB the authors recommended the eventual development of one form of the SVIB that would control for sex differences; in the meantime they endorsed development of occupational scales based on a common item pool, with both male and female norm groups for each occupation. The conclusion, that a single interest inventory for men and women would be beneficial, was also reached by Johnson (1970) after comprehensively evaluating the effectiveness of interest inventories with female clients.

The issue of whether to administer both male and female forms of the SVIB will soon be irrelevant, since the Strong-Campbell Interest Inventory (SCII), or the unisex Strong as it has also been labeled, recently became available. The larger question is whether male-normed scales (for example, those of the MVII and selected scales of the OIS-DD) can be applied to women, and vice versa. The issue is mainly a psychometric concern, but it does have some relevance to the counseling process, particularly in regard to score interpretation.

Summary. A primary role of interest inventories should be to generate career options and present clients with a complete picture of their vocational interests. The question exists whether interest inventories effectively perform that role with women clients. In order to maximize options for women, researchers have experimented with changing test directions, particularly to reduce career conflicts. In general, this procedure resulted in a raised level of vocational interests for women, that is, from low-status and low-salary "feminine" occupations to traditional "masculine" occupations. Others have recommended the use of the male form of the SVIB with women clients, on the basis of findings that this procedure yields an increase of high scores. Because of sexually stereotyped items, however, the appropriateness of applying sex-based norms to the opposite sex has been challenged. Although the development of the unisex Strong will end the debate regarding use of the male SVIB with women, the larger question remains whether sex-based norms should be used with the opposite sex and, if so, how those scores should be interpreted.

THE INTERPRETATION OF RESULTS

The results of interest inventories are conveyed to clients in various settings, including university and high school counseling centers as well as personal and employment counseling offices in industry and government. Since counselors are likely to have varying levels of expertise in measurement, most interest inventory manuals attempt to provide guidelines to assist them in translating scores into meaningful personal information for the client. These guidelines, at best, are quite broad.

In no instance does an interest inventory adequately deal with the complexities of sex-role stereotyping relevant to the world of work, or with the relevance of these issues for the counselor involved with career exploration. On the

contrary, the examination of manuals representing four popular interest inventories indicates that (1) test users and takers are generically male; (2) examples drawn from case studies reflect a world of work wherein women have certain traditional roles and men have separate, distinct roles; (3) by implication, career exploration should be consistent with "the world as it is"; and (4) the potential for any person to consider any career is not acknowledged, let alone encouraged.

In addition to manuals, guidelines for interpretation are contained in other materials, such as the OIS Form DD *Interpretive Leaflet*, which has been revised. Referring to the leaflet until recently in use, Tittle (1974) noted:

> The interpretive materials can be examined from a woman's viewpoint. The interpretive leaflet tells her, "your interest pattern should be one of the major considerations in making important educational and vocational decisions . . . ." The next paragraph makes the distinction that there are Occupational Scales, Women; College Major Scales, Women; Occupational Scales, Men; College Major Scales, Men. The clear and ever present distinction for women is reinforced: "In addition to scores under the headings marked Women, women will have scores under the heading marked Men in selected occupations and college majors where men predominate but opportunities for women are increasing [p. 68]."

The "clear and ever present distinction for women" observed by Tittle in the leaflet is also present, as previously mentioned, in the OIS manual.

Similarly, the *Interpretive Leaflet's* example of "Maxine" reinforces the status quo in society and her exclusion from professions with power and prestige (Tittle, 1974). In the example Maxine has high scores on the men's occupational scales of Optometrist, Pediatrician, Physician, Psychiatrist, Dentist, and Pharmacist. Since college majors in pharmacy, dentistry, premed, and the like were not then reported for women, Maxine could not show an interest in those academic areas. From the women's occupational scales her scores suggest a range of traditionally "feminine" careers for her consideration: Dietitian, Nurse, Dental Assistant, and Physical Therapist. The example of "Kitty Wiley" presented in the manual (p. 9) is similar in terms of the stereotypic assumptions. Although Kitty has high rankings in the men's occupational scales on Pediatrician, Photographer, Optometrist, Physician, and Psychiatrist, the corresponding college major scales are not reported for women and therefore not specifically offered for her consideration. As with Maxine, the women's occupational scales and college major scales present Kitty with options typically "feminine"—Physical Therapist, Nurse, Occupational Therapist, X-ray Technician, and Dental Assistant.

In a discussion of this type, two points need to be made very explicit and clear. First, the fact that it is repeatedly observed that women are routinely portrayed or are guided into "feminine" occupations, and that this is not desirable, has nothing to do with the respectability of those occupations. The concern lies with the way women characteristically are selected in or selected out of occupations. Persons of both sexes have the right to choose from the full spectrum of career options. Attitudes, pressures, and well-intended advice based on stereotypes of sex roles too often cloud the choice process so that a free choice is precluded. Therein lies the issue.

The second point of clarification is that sexism, or sex bias, is the cumulative effect of many small-scale, subtle influences and expectations. To some individuals many of the examples cited may seem so subtle as to be harmless (for example, statements from the manuals or interpretive materials). As discrete instances, they *may* be harmless; taken in aggregate, they can be oppressive. The point was conceptualized well by Schneider and Hacker (1973):

> People selectively define and perceive their worlds. Different sets of symbols represent different definitions, the variation depending in large part on the identity and location of those who create and use these symbols. Persons with sufficient power can often impose their definitions of reality on those who have less power; men have more prestige and power than women on almost every dimension of achievement and performance highly valued in the society. Just as racism is in part created, reflected and reinforced by symbols used by those who share this definition of reality, so sexism is created, reflected and reinforced [p. 13].

In addition to manuals and interpretive materials, the design and format of profiles may convey a stereotypic orientation to careers. Undoubtedly the old SVIB with its separate test booklets and

profiles for men and women symbolized an orientation toward sex-appropriate careers. The revision, the unisex Strong, constitutes an improvement in this area. Although it is probable that the difficult and complex problems of norming will not be solved, the unisex Strong does herald positive action. A single booklet and a single profile will be used; men and women will be scored on all scales. Occupations on the new SCII will comprise a pooling of scales from both older forms; some scales, however, were originally present only on one of the older forms. Unfortunately then, as noted by Tittle (1974), several of the occupations on the profile will have a designated "M" for male norms, but no "F" for female norms: ". . . it will still be apparent to women that there are some occupations which are to be viewed as male, even though women will receive a score for those occupations [p. 65]." It is through such subtleties that the attitude of sex-appropriate careers is perpetuated. Clarifying remarks in the SCII manual possibly could correct any misleading impressions derived from the "M" and "F" identification of criterion groups, making clear that the designations apply to the norm groups and not to the occupations themselves.

The development of attitudes that link certain occupations with one sex or the other begins early in the socialization process. Brady and Brown (1973) examined sex differences of 8- and 10-year-olds on selected vocational behavior variables. The sample consisted of 570 children representing five socioeconomic classes. Subjects were asked to respond to Galler's Occupational Choice Essay Form, which elicited a job choice, the reasons for the choice, and behaviors associated with it. Results indicated that boys were significantly higher than girls on a number of varied choices at ages 8 and 10; that 62 percent of 8-year-old girls and 56 percent of 10-year-old girls chose teacher, nurse, or housewife as an occupation. The authors concluded that girls have occupationally limited themselves by 8 years of age, and that 8- and 10-year-old girls' occupational aspirations are concentrated on nurturant and passive sex-typed career roles.

Limited occupational options for women were similarly noted in Schlossberg and Goodman's (1972b) study designed to discover sex stereotyping of occupations by kindergartners and sixth graders. Results indicated that both boys and girls consider women's occupational opportunities to be more limited than men's; for example, the children indicated that fixing cars or designing buildings was not something a woman could do, whereas she could work as a nurse, waitress, or librarian.

Meyer (1970) also questioned whether occupations are sex linked. Her sample consisted of 132 boys and girls in grades 3, 7, and 11. Results indicated that both boys and girls have strongly stereotyped ways of behaving toward traditionally sex-linked occupations.

Iglitzin (1972) described two studies examining sex stereotyping with fifth graders. The girls did have career aspirations, albeit stereotyped; but when asked to describe a typical day in their lives as adults, details of family life rather than career activities were emphasized.

Earlier research of Nelson (1963) indicated that the formation of occupational attitudes begins long before the ninth grade unit on careers. This finding was clearly confirmed by later studies (Brady & Brown, 1973; Iglitzin, 1972; Meyer, 1970; Schlossberg & Goodman, 1972b). Nelson observed that younger children's occupational fantasies arise from the questions asked of them, and that damaging occupational concepts may become internalized because little effort is made to help children develop an early and objective understanding of the world of work. The obvious implication is that such efforts must be made. Ten years have elapsed since the author's observations, and indications are that the objective understanding of the world of work Nelson called for still does not exist.

Adolescent vocational preferences were examined by Olive (1972). The females in the sample chose significantly higher social class status occupations than the comparable group of males. The females did not, however, aspire to the most prestigious positions, and though comparable in intelligence as a group to the male group, the females did not perceive themselves, even in fantasy choices, as occupying top-echelon positions of intellectual power and prestige.

The studies just cited, pertaining to early attitudinal development of sex-appropriate career

patterns, indicate the pervasive and imbedded quality of sex-role stereotyping. If manuals and interpretive materials are to counter those biases and instead convey that occupations can be for either sex, then that message must be blatant and clear. It will not suffice, for example, if interest inventory materials and other forms of career information simply omit stereotypic content; such materials must also convey a commitment to unbiased career decisionmaking.

Changing written material can be effected more quickly and economically than changing an individual's whole range of prevocational experiences or constructing new inventories; therefore a careful scrutiny of inventory manuals and interpretive materials utilized by counselors and clients would be a logical first step. Moreover, based on the premise that these materials are biased against women, adherence to the American Psychological Association's *Standards for Educational and Psychological Tests* (1974) dictates changes. Standard B1 states: "The test, the manual, the record forms, and other accompanying material should help users make correct interpretations of the test results and should warn against common misuses [p. 13]." Even more appropriate is a specific principle (B1.4), subsumed under the general standard, that states: "The manual should draw attention to, and warn against, any serious error of interpretation that is known to be frequent [p. 14]."

RECOMMENDED GUIDELINES

In summary, the following suggestions are offered to minimize errors and misrepresentations in the interpretation of interest inventory results:

1. Interest inventory manuals should—

a. specifically address the problems of occupational stereotyping and indicate the relevancy of the issue for the counselor engaged in career counseling;
b. acknowledge that, given comparable qualifications, all jobs are potentially available for persons of either sex;
c. clearly convey the intent of the test developers to generate all possible options for men and women;
d. dispel myths about women and the world of work that are based on sex-role stereotypes of careers and attitudes by describing the myths and countering them with the realities;
e. use a style of writing that does not contain a masculine bias, that is, does not imply that test users and takers are all males;
f. indicate in what ways the inventory results may limit options because of stereotyping effects, and then provide solutions to circumvent those limitations;
g. include a summary statement of the testing guidelines incorporated in Title IX of the 1972 Education Amendments of the Higher Education Act, with an accompaying explanation of how the test publishers are compliant with its directives.

2. Interpretive material should—

a. provide case studies that are representative of men and women, and portray them in a variety of jobs that are beyond traditional expectations in terms of type, level, and other factors;
b. provide guidelines for the interpretation of scores based on opposite-sex criterion groups;
c. provide the counselor with a discussion of factors that may affect a client's scores in a limiting way, such as home-career conflict, masculine-feminine stereotypes of intellectual behavior, and effects of early experiences on the development of interests.

3. Profiles should—

a. convey the idea that all occupations and college majors are possible options for both men and women;
b. use the same format for both sexes, thus encouraging men and women to consider the same career options.

By following guidelines such as these, use of interest inventories can be expected to expand career options for men and women, or at least minimize ineffective service based on stereotyping. Hopefully, the effect of generating and broadening options will extend to the total career-counseling process.

In the spirit of expanding vocational options for clients engaged in career decisionmaking, it may be that inventoried interests more frequently should be linked with expressed interests. There is some evidence that expressed in-

terests should be a greater part of the career-counseling process than they typically are. This is a particularly intriguing notion in view of the norming difficulties inherent in inventoried interests. Nelson (1971) concluded from his findings that for a thorough analysis of a client's occupational interests, the counselor should use both expressed and inventoried interests. Whitney (1969) also suggested using expressed choices, noting from his review of prediction studies based on expressed vocational choices: "The evidence seems to indicate some value in studying expressed choice further, especially in comparison with other, more frequently used predictors [p. 284]."

SUMMARY

One of the most crucial aspects of using interest inventories is the interpretation of results. For the person who is not informed about the complexities of stereotyping, particularly in regard to the development of vocational goals, interest inventories can contribute to the perpetuation of conventional career patterns for men and women. Interpretive materials were examined to determine whether they support or counter tradition-bound career choices. Related research pertaining to attitudinal development of sex-appropriate career patterns was reviewed. Specific guidelines were suggested for inventory manuals and interpretive materials to minimize deleterious effects resulting from stereotyped expectations and attitudes.

COUNSELOR AND CLIENT PERCEPTIONS OF INTEREST INVENTORY RESULTS

Except for the SDS, which can be self-scored and self-interpreted, results of interest inventories are interpreted by a counselor to a client. Assistance of computerized systems, for vocational guidance in general and interpretation of inventory scores in particular, is relatively new, so that the comparative effectiveness of mechanical and traditional counseling techniques is not yet known. As computerized systems are developed, they should be examined for stereotyping and restriction of choices for women (Tittle, 1974). For the most part, however, interest inventory results are conveyed and interpreted to clients in the traditional counseling method of dyadic or small-group interactions.

COUNSELOR-CLIENT INTERACTION

Research designed to examine whether and, if so, in what manner counselors are intereacting with women clientele in a biased, restricting manner is a fairly recent development. Nonempirical observations, however, have provoked sporadic cautions to counselors throughout the past decade. Heist (1962), for example, noted that although women in general scored the same as or better than men on measures of abstract thinking and on SVIB-M intellectual categories, women characteristically looked ahead to marriage, with education or employment as only a temporary involvement. In view of that, Heist conjectured that stereotypes of the female role militate against strong academic, vocational, and professional commitments, and that both the home and the school reinforce that stereotype. Ten years later Karmon (1973) similarly rebuked education for having little or no effect on expanding women's awareness or interests beyond the stereotypic career roles.

Gurin, Nachmann, and Segal (1963) observed a high incidence of abrupt terminations by college women who sought vocational counseling. This led the authors to consider the technical problems in career counseling with women. They hypothesized that women clients, who must confront the cultural stereotypes of the feminine, nonintellectual woman versus the masculine, intellectual woman, may view a commitment to vocational counseling as a commitment to making a choice of sexual identity. The authors concluded that counselors must confront their own stereotypes of "feminine" and "masculine" vis-a-vis intellectual behaviors, lest they alienate clients. Relatedly, Farmer (1971), from her concern that women be encouraged to develop academic potential, identified the need for counselors to create a clear sanction for women to combine home and career.

Cognizant of the home-career conflict for many young women, Rossi (1965) suggested that more women scientists would be produced by (1) giving more stress to future family roles of boys and occupational roles of women, (2) lightening domestic concerns of employed women by applying technology to problems of home maintenance, (3) encouraging commentaries from men who find marriage to a professional woman satisfying, and (4) discouraging the guidance of women toward restricted occupational goals under the pretext of being realistic.

The extent and manner in which counselors use "reality" to dissuade women from "masculine" occupations is particularly clear in a study by Pietrofesa and Schlossberg (1971). To test the hypothesis that counselors were biased against women's entering deviate occupations, the authors arranged individual interviews between 29 counselor trainees and a female-coached client who expressed indecision about whether to enter engineering or the field of education. Tape recordings of the interviews were analyzed for positive bias (support) and negative bias (disapproval) toward the client's entering the "masculine" field. Results indicated that both male and female counselor trainees displayed negative bias. Of the total bias statements, 81.3 percent and 18.7 percent were biased against and for women respectively. Following are representative negative-bias statements of the counselor trainees:

1. The status of women is higher in the field of teaching.
2. You would only be gone from home during school hours if you taught school.
3. Engineering would take five years and elementary education would be four years . . . . These are things you might want to consider.
4. There might be a holding of you back because you're a woman.
5. Engineering is very, you know, technical and very—I could use the term "unpeopled."
6. You normally think of this as a man's field.

The authors suggested that such statements influence women clients toward tradition-bound, stereotyped options.

The question arises whether similar negative bias would have been displayed against a male client, with comparable qualifications, confronting the same indecisiveness between engineering and education. An attempt to answer this is contained in an investigation by Smith (1973), who, unlike other researchers (Broverman, Broverman, Clarkson, Rosenkrantz, & Vogel, 1970; Friedersdorf, 1969; Hawley, 1971, 1972; Pietrofesa & Schlossberg, 1971; Thomas & Stewart, 1971), included male clientele to whom counselor subjects responded. Her results suggest that counselor recommendations of vocational choices for clients are not influenced by the sex of the client. By using case study materials with the sex of the hypothetical client systematically varied, the author was able to control for effect of client sex, a significant control missing in other research. Smith's findings indicate that counselors behave similarly to male and female clients.

The findings of Thomas and Stewart (1971) indicate that a female client who is ambivalent regarding a deviate career goal may find counseling more hindering than helpful. The purpose of the study was to determine whether secondary school counselors respond more positively to female clients with traditional rather than nontraditional career goals. Five stimulus interviews with high school girls were presented on audiotape to 64 practicing counselors. Analysis of counselor responses indicated that "(1) female counselors gave higher Acceptance scores to both deviate and conforming clients than did male counselors, (2) counselors, regardless of sex, rated conforming goals more appropriate than deviate goals, (3) counselors, regardless of sex, rated female clients with deviate career goals to be in more need of counseling than those with conforming goals [p. 352]." The same question applied to the Pietrofesa and Schlossberg (1971) findings is appropriate here: Would similar results occur with male clients of comparable qualities who expressed ambivalence about pursuing deviate career goals? Clearly, additional research is needed to assess more accurately the differential responses of counselors to men and women with nontraditional vocational concerns.

Friedersdorf (1969) also examined the attitudes of secondary school counselors toward career plans of female clients. Male and female practicing counselors participated in the study by completing the SVIB-W and then role-playing the part of either a college-bound or a non-

college-bound high school girl. Counselor attitudes apparent from the role playing included the following: (1) Male counselors associated feminine occupations at the semiskilled level with college-bound girls, whereas female counselors associated occupations requiring a college education with college-bound girls. (2) Male counselors tended to think of women in traditional roles characterized by feminine personality traits, whereas female counselors tended to expand career options beyond traditional work roles. (3) Male counselors perceived college-bound girls as having positive attitudes toward traditionally feminine occupations and did not consider traditionally masculine careers appropriate for college-bound girls.

The striking feature of both Friedersdorf's and Thomas and Stewart's findings is that counselors in general tend to perceive traditional career goals as more appropriate for women clients than the nontraditional "masculine" careers. The consequence of counselors holding values regarding the appropriateness of occupations based on sex is an effect on the counseling process and its outcomes, namely, perpetuation of conventional patterns of career choices.

An indication that counselors, at least female counselors, may be reassessing the value of sex-appropriate occupations is apparent from a recent study by Hawley (1972). Pursuant to the finding of earlier research that a significant relation exists between the careers women choose and their beliefs regarding men's view of the feminine ideal (Hawley, 1971), Hawley asked 136 women students to respond to a scale of 35 statements of ideal feminine attitudes and behaviors as they believed significant men in their lives viewed the attitudes and behaviors. The subjects represented three professional fields: teachers in training, math-science majors, and counselor trainees. It was hypothesized that students in teaching, a traditional feminine profession, would score toward the dichotomous end of the scale, that is, perceive men's view of behavior as not having a sex referent; and that counselors' scores would occupy a middle position on the dichotomous-androgynous continuum. The hypothesis was confirmed by the results, except those for the counselor group, whose scores were closer to the androgynous end:

> Counselors in the present study had a relatively broad view of male notions of feminity. They can help female clients become aware of a variety of life styles and career choices, all of which can be viewed as feminine by some men. A career in homemaking can be considered as personally rewarding and as socially contributive as a career in science because the androgynous model merely expands the options; it does not imply that any choice is superior to any other [p. 313].

Since the subjects in this study were all women, an unanswered question is whether male counselors share the androgynous view that behavior is not sex specific. The findings of other studies suggest they may not (Friedersdorf, 1969; Thomas & Stewart, 1971).

Another aspect of Hawley's research is noteworthy. In an investigation based on the hypothesis that men's views play a significant, though unrecognized, part in women's career choices (Hawley, 1971), 86 women subjects representing three subgroups—homemakers (not gainfully employed), those in feminine careers (traditionally feminine jobs), and those in androgynous careers (male-dominated jobs)—were asked to respond to 80 attitudinal or behavioral statements as they thought significant men in their lives would respond. Results indicated that a relation does exist between women's career choices and their perceptions of significant men's view of the feminine ideal. For example, women in traditionally feminine occupations tended to think men view behavior in a sex-linked way, that is, appropriately male or female. Women outside the feminine career group did not perceive men as making sex the basis for the behaviors described. This finding was replicated in Hawley's (1972) later study in which the subject sample comprised student teachers, math-science majors, and counselor trainees.

Findings of Hawley (1971, 1972) and Farmer and Bohn (1970) have implications for the counselor engaged in career exploration. If a large proportion of women, such as homemakers and those in traditionally "feminine" occupations, are significantly influenced toward conventional choices because of a disposition to act as they

believe men prefer them to, then a wider range of options might be considered by women if they thought men would approve. Clearly, programs for men and women designed to reduce stereotyping are necessary. To unlearn, however, that behaviors are sex appropriate is a challenging educational endeavor, albeit a necessary one. An unfortunate corollary is that behaviors not only are viewed as appropriate for one sex or the other but also are differentially perceived as mentally healthy or not.

Evidence that behaviors for healthy males are not the same as for healthy females was provided by Broverman, Broverman, Clarkson, Rosenkrantz, and Vogel (1970). The judgment of 79 clinically trained psychologists, psychiatrists, and social workers (46 males, 33 females) confirmed their hypothesis that characteristics of healthy individuals would differ as a function of sex and that the differences would be congruent with stereotypic sex-role differences. They obtained their data by asking clinicians about characteristics of healthy adult men, healthy adult women, and healthy adults with sex unspecified. For each of the three types, characteristics were indicated by the clinicians' responses to 122 bipolar items, each pole characterized as typically masculine or feminine. Commenting on their findings, Broverman et al. note:

> In our society, men and women are systematically trained, practically from birth on, to fulfill different social roles. An adjustment notion of health, plus the existence of differential norms of male and female behavior in our society, automatically leads to a double standard of health. Thus, for a woman to be healthy, from an adjustment viewpoint, she must adjust to and accept the behavioral norms for her sex, even though these behaviors are generally less socially desirable and considered to be less healthy for the generalized competent, mature adult [p. 6].

The findings of the foregoing studies (Broverman et al., 1970; Friedersdorf, 1969; Hawley, 1971, 1972; Pietrofesa & Schlossberg, 1971; Smith, 1973; Thomas & Stewart, 1971) have clear implications for the counseling process, as already indicated, and for the general domain of social action as well. Attacking the deterrents to extensive and free career choices must include affirmative action outside the counseling hour.

IMPORTANCE OF INTEREST INVENTORY RESULTS

It is difficult to say how significant interest inventory results actually are or, in fact, to determine how influential career counseling is. D'Costa (1969) described interest inventories as having a twofold value: for the student as facilitative in vocational exploration and self-understanding; for the counselor as a vehicle for understanding student needs. In a brief description of the Ohio Vocational Interest Survey (OVIS), D'Costa (1972) described the instrument as designed to facilitate vocational exploration rather than to predict and recommended that it be used in conjunction with other instruments. In one attempt to systematically look at the usefulness of interest inventories from both the client's and the counselor's viewpoint, King and Bellezza (1969-70) compared use of the OIS with use of the SVIB. Entering freshmen at a junior college were given their OIS and SVIB profiles at seven group meetings. During the meetings an experienced counselor provided some explanation of the results and conducted short discussion periods. Results of a questionnaire administered at the end of the meetings indicated that 55 percent of the students found the OIS more helpful, 18 percent preferred the SVIB, and 27 percent were undecided. The counselors found the OIS more valuable in eliciting information from clients, but preferred the SVIB as a counselor tool. The researchers concluded that the results did not indicate superiority of one instrument over the other, and that counselors generally found both useful. The conclusions appear to be rather tenuous, however, since only the clients' and counselors' self-reports were used to determine usefulness.

Some would agree with Smith (1973):

> Educational and career choices are most often determined by a person's socio-economic status, aptitudes and interests, and parental encouragement received. Thus, personalogical and cultural influences overshadow the impact of the bias expressed by a counselor in a brief encounter [p. 93].

Holland (1974) takes a similar stance. In a discussion focusing on means to reduce systematic bias in the delivery of vocational services, Holland opined that people's life histories, more

than biases of counselors and interest inventories, orient them toward some occupations rather than others:

> Because interest inventories simply tally the effects of one's special history and heredity, the most influential strategy would be to modify the life histories of people before they go to work rather than to revise vocational interventions. Contrary to popular opinion, counseling interventions usually have minor effects upon vocational aspirations. Major effects appear more likely if we are able to influence people at younger age levels in ways that are consistent with some theoretical understanding of the development of vocational aspirations [p. 8].

Holland then proceeded to suggest several channels for social action. In that discussion he referred again to interest inventories, and stated in their defense: "In general, interest inventories seem to be less biased and more helpful than most forms of vocational assistance [p. 9]."

Understandably enough, Holland's remarks indicate a clear preference for channeling the focus for change away from interest inventories to "social action." It is unlikely that the suggestion to engage in social action would be challenged. On the other hand, it is contestable whether professionals should "modify the life histories of people before they go to work *rather than* to revise vocational interventions [p. 8, emphasis supplied]." Suggesting remediation to be an either-or proposition—either modification of life histories or revision of vocational interventions—is not constructive. More appropriate is a mandate to do both. Additionally, of the two strategies, the latter is undoubtedly the more manageable and the more practical for putting into immediate effect.

Enriching prevocational experiences are valuable and desirable. Support for such experiences is contained in the longitudinal study of the career planning of college women conducted by Almquist and Angrist (1970). The study focused on career-oriented girls who chose male-dominated occupations. The hypothesis—that broadening and enriching experiences have a definite effect on career planning—was well supported when data on the mothers' work histories, the students' own work experience, and the influence of occupational role models were assessed.

Broadening prevocational experiences was explicitly mentioned by Holland (1974) as one of the means to increase vocational options for all persons. Among his suggested remedies are (1) action to broaden everyone's prevocational experiences, such as opening all educational experiences to men and women, eliminating sex discrimination in part-time jobs sought by young men and women, and reducing the use of sex-stereotyped materials and activities in elementary schools; (2) support of professional commissions and recommending that they broaden membership to include consumers and test publishers; (3) formulation and adoption of general guidelines to alert publishers, consumers, and authors to the problems as well as to possible solutions; (4) research designed to evaluate how vocational interventions and their revisions affect individuals; and (5) research to study the development of vocational aspirations, with a special focus on early determinants of vocational preferences.

To respond to the strategies for social action suggested by Holland, and to generally facilitate effective career exploration, counselors must be both aware and committed. Educational programs, workshops, and conferences are needed. The counselor, for example, should be aware of such deterrents as the home-career conflict for women and the restricting influence of some prevocational experiences on inventoried interests. Another consideration is related to when an interest inventory is most effectively introduced into the counseling process. Ryan and Gaier (1967) considered the interest inventory as possibly "adding to a self-fulfilling prophecy for many students who are not as yet aware of their potentials or of the multiplicity of courses and fields available to them as individuals [p. 40]." The authors concluded that in some instances extended individual counseling is necessary before interest inventories can be very helpful.

Schlossberg and Pietrofesa (1973) assumed that sex stereotyping exists, then designed counselor workshops to change attitudes. On the basis of their training involvements, they recommended for participants new cognitive understandings through lectures and reading; use of group techniques for consciousness raising; use

of audio-video taping and role playing to develop helping skills; and development and implementation of programs. They referred to counselor education hopefully: "We are educable. We can help ourselves with new perspectives. We can free ourselves from ideas which restrict our thinking and which, in turn, may restrict our clients' behavior [p. 45]."

SUMMARY

Several studies were reviewed which highlighted the need for counselors to be aware of their own stereotypes, lest they alienate clients and restrict them to a narrow range of career options. It was noted that counselors generally tend to view traditional career goals as more appropriate for women than the nontraditional "masculine" goals. Unfortunately, such values affect the counseling process and its outcomes—they perpetuate stereotypic career patterns. To effect changes in the status quo, several areas warrant attention: strategies for social action; development of educational experiences for counselors designed to free sex roles and broaden options for men and women; and revision of vocational interventions.

SUMMARY AND CONCLUSIONS

Counselors are being exhorted more and more frequently to be aware of stereotyping, particularly as it affects career and lifestyle options for women clientele. Part of the concern stems from the observation that women are typically guided into conventional career patterns based on stereotypic attitudes and expectations rather than on values, abilities, and well-developed interests. The question arises whether interest inventories contribute to the perpetuation of tradition-bound career choices for women and, if so, in what manner.

Research related to the issues of sex bias in the use of interest inventories was reviewed, particularly from the client's view of the career-exploration process. It is only recently, however, that researchers have attended to the impact of sex-based stereotyping in career counseling; much of the research is yet to be designed and implemented.

Since counselors refer to manuals and interpretive materials to obtain norming information and guidelines for score interpretation, these materials are influential in the career-exploration process. They were examined and found to contain both explicit suggestions and subtle implications which, if followed by the counselor, could have deleterious effects on women clientele. Recommended changes for manuals and interpretive materials were aimed at maximizing the counselor's effective use of interest inventories on the client's behalf. The entire issue of sex-role stereotyping, for example, with all its complexities and its ramifications for women and the world of work, needs to be explicitly discussed in manuals. If manuals and interpretive materials are to convey that occupations can be for either sex, then that message must be blatant, for sexual bias is both pervasive and subtle.

One criticism leveled against interest inventories is that they present a limited range of career options for women. Attempts have been made to increase the array of career choices presented to women by administering the men's form of the SVIB to women in addition to the women's form, and by changing the test-taking directions of the SVIB so that women make their responses with an altered response set.

The several studies in which test-taking instructions were modified suggest that inventory patterns will change if attitudinal response sets change—specifically, if women experience a reduction of the home-versus-career conflict and if they perceive men as approving nontraditional career goals. These findings seem particularly significant when coupled with results of other research indicating that women's career choices are affected by what they think men believe is ideal female behavior.

Regarding the administration of the men's SVIB to women, researchers report an increase of high scores. Critics of this procedure have challenged the appropriateness of applying sex-based norms to the opposite sex, however, and have raised questions about the intepretability of results, since the scales were not developed with a control for sexual stereotypes. Although

the advent of the unisex Strong will cause the debate regarding use of the male SVIB with women to be irrelevant, the larger question remains of how to interpret scores derived from criterion groups of the opposite sex.

Since the results of an interest inventory are generally conveyed to the client in the traditional dyadic or small-group setting, the interaction between counselor and client is significant. On the client's part, unless there have been broadening prevocational experiences, it is likely that the female client will consider traditional "feminine" occupations as appropriate options. A growing area of research indicates that in early elementary school years boys and girls have developed attitudes that view occupations as appropriate for one sex or the other. Just as clients carry these early imbedded stereotypes to the career-counseling sessions, so does the counselor. Most of the research relevant to counselor bias indicates that counselors of both sexes view traditionally "feminine" occupations as more appropriate for women clientele than "masculine" career goals. Whether the converse is also true—whether counselors would exhibit the same bias toward males presenting nontraditional vocational aspirations—is not clear from the research.

Although interest inventories represent only one form of input to the total career-counseling process, their use is particularly significant because inventory results typically suggest the interest areas that are explored in counseling sessions. Research shows that the options generated by the inventories include certain specific career considerations for each sex and exclude others. That situation defines a sober issue. It is not a simple issue but a complex one, since other factors—such as stereotyped attitudes of the counselor and the client and those reflected in inventory manuals and interpretive materials—interact with interest inventory results.

Concerned professionals have begun to focus on the issue of sex bias in career counseling, so that the problematic aspects are becoming better conceptualized and articulated. From these discussions varied suggestions have emerged to channel energies toward corrective interventions. Among those suggestions are (1) social action to alter prevocational experiences of men and women so as to maximize the range of vocational interests and aspirations; (2) research to examine the development of interests, particularly in the neglected area of women's vocational goals; (3) workshops where counselors can develop an awareness of sex roles and strategies to counter the biases of stereotypes; (4) revision of interest measures; and (5) modification of inventory manuals and interpretive materials.

All of the recommendations are viable and promising; some are more easily implemented than others. For example, revising several pages of a manual could be more quickly effected than developing a totally new inventory or programing life experiences that are stereotype free. Without discarding potential remedies, priorities must be thoughtfully set. The relative lack of difficulty in the task, as well as the immediacy with which the objective could be achieved, lends cogency to high-priority efforts for the modification of manuals and related interest inventory materials.

REFERENCES

Almquist, E. M., & Angrist, S. S. Career salience and atypicality of occupational choice among college women. *Journal of Marriage and the Family*, 1970, 32, 242-249.

American Psychological Association. *Report of Task Force on Issues of Sexual Bias in Graduate Education.* Washington: Author, 1973.

American Psychological Association. *Standards for educational and psychological tests.* Washington: Author, 1974.

Angrist, S. S. Counseling college women about careers. *Journal of College Student Personnel*, 1972, 13, 494-498.

Birk, J. M., Cooper, J., & Tanney, M. F. Racial and sex role stereotyping in career information illustrations. Paper presented at annual convention of American Psychological Association, Montreal, 1973.

Brady, R. P., & Brown, D. B. Women's lib and the elementary school counselor. *Elementary School Guidance and Counseling*, 1973, 7, 305-308.

Broverman, I. K., Broverman, D. M., Clarkson, F. E., Rosenkrantz, P. S., & Vogel, S. R. Sex-role stereotypes and clinical judgments of mental health. *Journal of Consulting and Clinical Psychology*, 1970, 34, 1-7.

Campbell, D. P. *Manual for the Strong Vocational Interest Blanks.* (Revised) Stanford, Calif.: Stanford University Press, 1966.

Campbell, D. P. *Handbook for the Strong Vocational Interest Blanks.* Stanford, Calif.: Stanford University Press, 1971.

Campbell, D. P. Women deserve better. *Personnel and Guidance Journal*, 1973, 51, 545-549.

Clark, K. E., & Campbell, D. P. *Minnesota Vocational Interest Inventory Manual*. New York: Psychological Corporation, 1965.

Constantinople, A. Masculinity-femininity: An exception to a famous dictum. *Psychological Bulletin*, 1973, 80, 389-407.

Cook, B. Roles, labels, stereotypes: A counselor's challenge. *Journal of the National Association of Women Deans and Counselors*, 1971, 34, 99-105.

Crites, J. O. *Vocational psychology*. New York: McGraw-Hill, 1969.

D'Costa, A. G. The role of interests and interest measurement in guidance. Paper presented at annual convention of American Personnel and Guidance Association, Las Vegas, 1969.

D'Costa, A. G. OVIS: A non-predictive device. Paper presented at annual convention of American Personnel and Guidance Association, Chicago, 1972.

Eyde, L. D. Eliminating barriers to career development of women. *Personnel and Guidance Journal*, 1970, 49, 24-28.

Farmer, H. S. Helping women to resolve the home-career conflict. *Personnel and Guidance Journal*, 1971, 49, 795-801.

Farmer, H. S., & Bohn, M. J. Home-career conflict reduction and the level of career interest in women. *Journal of Counseling Psychology*, 1970, 17, 228-232.

Friedersdorf, N. W. A comparative study of counselor attitudes toward the further educational and vocational plans of high school girls. Unpublished manuscript, Purdue University, 1969.

Gurin, M. G., Nachmann, B., & Segal, S. J. The effect of the social context in the vocational counseling of college women. *Journal of Counseling Psychology*, 1963, 10, 28-33.

Hall, G. Changing sex roles in the labor force. *Phi Delta Kappan*, 1973, 45, 135-137.

Harmon, L. W. Sexual bias in interest measurement. *Measurement and Evaluation in Guidance*, 1973, 5, 496-501.

Hawley, P. What women think men think: Does if affect their career choice? *Journal of Counseling Psychology*, 1971, 18, 193-199.

Hawley, P. Perceptions of male models of femininity related to career choices. *Journal of Counseling Psychology*, 1972, 19, 308-313.

Hedges, J. N. Counseling of girls and mature women. *Employment Service Review*, December 1964.

Heist, P. A commentary on the motivation and education of college women. *Journal of the National Association of Women Deans and Counselors*, 1962, 25, 51-59.

Holland, J. L. *Professional Manual for the Self-Directed Search*. Palo Alto, Calif.: Consulting Psychologists Press, 1972.

Holland, J. L. Some guidelines for reducing systematic biases in the delivery of vocational services. *Measurement and Evaluation in Guidance*, 1974, 6, 210-218.

Huth, C. M. Measuring women's interests: How useful? *Personnel and Guidance Journal*, 1973, 51, 539-545.

Iglitzin, L. B. A child's view of sex roles. *Today's Education*, 1972, 61, 23-25.

Johansson, C. W., & Harmon, L. W. The SVIB: One form or two? *Journal of Counseling Psychology*, 1972, 19, 404-410.

Johnson, R. W. (Ed.). Use of interest inventories with women. *Counseling Center Research Report*, 3(13). University of Wisconsin, 1970.

Karmon, F. J. Women: Personal and environmental factors in career choice. Paper presented at annual convention of American Educational Research Association, New Orleans, 1973.

King, L. A., & Bellezza, F. A comparison of two vocational interest tests used with general college students. *General College Studies*, 6(3). University of Minnesota, 1969-1970.

Kuder, G. F. *General Manual, Kuder Occupational Interest Survey, Form DD*. Chicago: Science Research Associates, 1971.

Laime, B. F., & Zytowski, D. G. Women's scores on the M and F forms of the SVIB. *Vocational Guidance Quarterly*, 1963, 12, 116-118.

Magoon, T. M. Annual college and university counseling center data bank, 1972-1973. College Park: University of Maryland, 1973. (Mimeographed)

McCarthy, M. K., & McCall, R. J. Masculinity faking on the FM scale of an interest inventory. *Personnel and Guidance Journal*., 1962, 41, 346.

Meyer, M. M. Patterns of perceptions and attitudes toward traditionally masculine and feminine occupations through childhood and adolescence. (Doctoral dissertation, Michigan State University) Ann Arbor, Mich.: University Microfilms, 1970, No. 70-15,084.

Munley, P. H., Fretz, B. R., & Mills, D. G. Female college students' scores on the men's and women's Strong Vocational Interest Blanks. *Journal of Counseling Psychology*, 1973, 20, 285-289.

Nelson, G. A. Discrepancy between expressed and inventoried vocational interests. *Vocational Guidance Quarterly*, 1971, 20, 21-24.

Nelson, R. C. Knowledge and interests concerning 16 occupations among elementary and secondary school students. *Educational and Psychological Measurement*, 1963, 23, 741-754.

Olive, H. Sex differences in adolescent vocational preferences. *Vocational Guidance Quarterly*, 1972, 21, 199-201.

Pietrofesa, J., & Schlossberg, N. K. Counselor bias and the feminine occupational role. In N. Glazer-Malbin & H. Y. Walker (Eds.), *Women in the society and economy*. Chicago: Rand McNally, 1971.

Prediger, D. J. Converting test data to counseling information. (ACT Research Report No. 44) Iowa City: American College Testing Program, 1971.

Prediger, D. J. Tests and developmental career guidance: The untried relationship. *Measurement and Evaluation in Guidance*, 1972, 5, 426-429.

Pringle, M. B. Counseling women. Paper presented at annual convention of American Personnel and Guidance Association, Atlantic City, 1971.

Rossi, A. S. Women in science: Why so few? *Science*, 1965, 148, 1196-1202.

Ryan, D. W., & Gaier, E. L. Interest inventories and the developmental framework. *Personnel and Guidance Journal*, 1967, 46, 37-41.

Schlossberg, N. K. A framework for counseling women. *Personnel and Guidance Journal*, 1972, 51, 137-143.

Schlossberg, N. K., & Goodman, J. Imperative for change: Counselor use of the Strong Vocational Interest Blanks. *Impact*, 1972, 2, 25-29. (a)

Schlossberg, N. K., & Goodman, J. A woman's place: Children's sex stereotyping of occupations. *Vocational Guidance Quarterly*, 1972, 20, 266-270. (b)

Schlossberg, N. K., & Pietrofesa, J. Perspectives on counselor bias: Implications for counselor education. *Counseling Psychologist*, 1973, 4, 44-54.

Schneider, J. W., & Hacker, S. L. Sex-role imagery and use of the generic "man" in introductory texts: A case in the sociology of sociology. *American Sociologist*, 1973, 8, 12-18.

Scott, Foresman and Company. *Guidelines for improving the image of women in textbooks*. Glenview, Ill.: Author, undated.

Smith, M. L. Notes on "Perspectives on counselor bias: Implications for counselor education." *Counseling Psychologist*, 1973, 4, 93.

Sparks, J. The effects of male role playing on the inventoried interests of high school girls. Unpublished master's thesis, Teachers College, Columbia University, 1967.

Stanfiel, J. D. Administration of the SVIB men's form to women counselees. *Vocational Guidance Quarterly*, 1970, 19, 22-27.

Super, D. E., & Crites, J. O. *Appraising vocational fitness*. (Rev. ed.) New York: Harper & Row, 1962.

Thomas, A. H., & Stewart, N. R. Counselor response to female clients with deviate and conforming career goals. *Journal of Counseling Psychology*, 1971, 18, 352-357.

Tittle, C. K. *Women and educational testing: A selective review of the research literature and testing practices*. Princeton, N.J.: Educational Testing Service, 1974.

U.S. Department of Labor, Employment Standards Administration, Women's Bureau. *Women workers today*. (Bulletin 3119) Washington: Government Printing Office, 1971.

U.S. Department of Labor, Employment Standards Administration, Women's Bureau. *Careers for women in the 70's*. (Bulletin 512-381-77), Washington: Government Printing Office, 1973.

Whitney, D. R. Predicting from expressed vocational choice: A review. *Personnel and Guidance Journal*, 1969, 48, 279-286.

A Consideration of Race in Efforts To End Sex Bias

/7

Janice Porter Gump
HOWARD UNIVERSITY

L. Wendell Rivers
UNIVERSITY OF MISSOURI

ABSTRACT

Are efforts to decrease sex bias necessary for black women? Though the needs of other minority women were deemed important, it was feasible in this paper to examine relevant issues only for black women. Discussed with respect to black women are current status, occupational choice, motivation, sex-role attitudes, and technical issues in interest inventories.

Though more black than white or Spanish-heritage women were members of the labor force in 1970, they earned less than any group of women or men, including black men. Nonetheless, their earnings were more crucial to the welfare of their families than were the earnings of white women: in 1969 the median income of black families with both husband and wife employed was $7,782, whereas the median income of white families with only one earner was $8,450.

Apparently, black women desire and expect to combine full-time employment with the traditional roles of wife and mother to a significantly greater extent than do white women. Yet, given their history of and expectations for working, they have in fact engaged in occupations traditional for women to a greater extent than have their white counterparts. Gurin and Katz (1966) found high aspiration in black college women inconsistent with subjects' conception of femininity. Turner (1972) found that half her sample of black college women actually wanted less work involvement than they anticipated, while almost half the white women wanted more; further, though high career expectations were related to competitive and egalitarian parental child-rearing values among the white women, for the black women high career expectations were related to what appeared to be perceptions of the expectations and desires of others.

It is suggested, then, that the black woman's expectations for employment and actual participation in the labor force do not so much reflect an embracing of the achievement ethic, or simply economic need, as they reflect an initially imposed but presently incorporated sense of responsibility. It is not so much that the black woman has been able to escape the constraints of the traditional feminine role as that she has had to take on in addition aspects of the traditional masculine role. In fact, she appears to endorse the traditional view of the feminine role to a larger extent than does the white woman, believing that a woman's identity derives primarily from marriage and that a woman should be submissive to a man. Thus she appears at least as needful of efforts to increase her options as does the majority woman, even though data might be put forth suggesting that she has already been "liberated."

The consideration of technical issues reveals that there are few validity data supporting the use of interest inventories with minority women. There may be a mismatch between the interest structures of minority women and those of the normative groups or criterion groups used to validate the interest scales. The interest inventory may well be biased against the minority woman from the standpoint of sex as well as ethnic membership. It is suggested that the use of a moderator variable for minority groups might enhance the validity of interest scales for such populations.

INTRODUCTION

The fundamental issue underlying the present effort of the National Institute of Education's Career Education Program is increasing opportunities for women. "Women," however, are a nonhomogeneous group, and it seems inappropriate to proceed as if differences in age, race, and socioeconomic class are nonsignificant. When differences as powerful as these are ignored, it is usually to the detriment of those who are not of the majority. Thus it appears necessary to study different kinds of women. It is only an assumption that efforts to decrease sex bias are equally necessary for all women, an assumption that all such efforts should be identical and would be equally effective. The purpose of this paper is to examine the need for sex-fairness efforts for a particular group of women and to relate those needs to the measurement of vocational interests.

It was originally intended that all minority women and women of different classes would be discussed in this paper. That charge proved to rest upon the same fallacy cited above; just as all women are not alike, neither are all minority women alike. To attempt to treat them in a single paper and to include what we know of the effect of class on occupational aspiration and attainment seemed inappropriate, if not impossible. The paucity of information about Mexican Americans, Puerto Ricans, American Indians, and Asian Americans notwithstanding, the women in these groups deserve treatment of their special status that would be difficult to incorporate in a single paper. (Interestingly, where comparative studies reviewed in this paper included these groups, sex was rarely examined.) The scope of the paper has thus been delimited: major focus will be directed toward black women, with findings pertinent to other minorities discussed where appropriate and available.

Some, including many blacks, could argue that black women are not in need of the same restitutive efforts required for white women. A number of authors (including Bernard, 1966; Bock, 1971; and Moynihan, 1965) have pointed to the black woman's "unnatural superiority" to the black man in education and employment. Weston and Mednick (1972) found less fear of success among black than among white women, and Epstein (1972), in her study of black professional women, suggested that the double negative status might be facilitative, in that each of the negatively valued statuses of black and female may cancel the effect of the other.

Yet, other data suggest the black woman suffers from the double negative status: she earns less, for instance, than all other men (including black men) and less than any other group of women. This paper will seek to explore such possible inconsistencies. Accordingly, the following will be examined: (1) the status of minority women in the world of work; (2) comparative aspirations of black and white women; (3) career expectations and preferences; (4) occupational choice; (5) motivation in black women; (6) sex-role attitudes; and (7) technical aspects of interest inventories with respect to minority women (norming procedures and perceptions of inventories). A composite portrait will be attempted from which generalizations and recommendations with respect to interest inventories will be drawn.

MINORITY WOMEN AND THE WORLD OF WORK

Of white women 16 years of age and over, 40.6 percent were in the 1970 labor force, while 38 percent of Spanish-heritage women and 47.5 percent of blacks participated (U.S. Department of Commerce, 1973). Hill (1972) found that in black families 65 percent of the female spouses worked full or part time, whereas the comparable figure for white female spouses was 44 percent. Moreover, though 26 percent of black wives in two-parent families worked full time, only 6 percent of white wives were so employed. Clearly, black women enter the work force in larger numbers than do their white counterparts.

If the participation of black women in the labor market is proportionately high, their remuneration is absolutely low. Black women earn less than any ethnic group, male or female.

TABLE 1.—*Median earnings in 1969 of experienced civilian labor force, 1970*

Ethnic group	Sex	
	Female	Male
Negro	$3,008	$5,194
Spanish heritage[a]	3,241	6,034
Total	3,649	7,610

[a]Those of Spanish heritage referred to are Puerto Ricans, Mexican Americans, and others whose mother tongue or surname is of Spanish origin.

Source: U.S. Department of Commerce, *United States Summary: Detailed Characteristics, 1970 Census of the Population.*

In 1969 the median income of black families with *both* husband and wife employed was $7,782, whereas the median income of white families with *only one* earner was $8,450 (Hill, 1972). Clearly the earnings of black women, though low, are more crucial to the well-being of their families than are the earnings of white women.

The demographic picture of the working nonwhite woman is more fully sketched by examining the occupations she and her white counterpart have assumed. The occupational status of white and nonwhite women for the years 1910, 1960, and 1970 is presented in table 2. Whereas 90 percent of nonwhite women were agricultural labors, domestics, or service workers in 1910, 35.4 percent of white women were so employed Though the proportion of nonwhite women filling low-level occupations has diminished during the last half century, nonetheless almost half the nonwhite women in the labor force were employed in such occupations during 1970, in comparison with one-fifth of the white female labor force.

Proportionately to white women, however, black women have made greater strides in becoming members of the professional, managerial, and technical class. From 1.5 percent in 1910, the representation of black women increased to 10.0 percent in 1970. The concomitant increase among whites was from 11.6 to 15.5 percent. Black women, however, hold more traditionally feminine jobs within the professional ranks: in 1970, 54 percent of black women employed in this classification were teachers, as compared with 39 percent of whites (Ginsberg & Hiestand, 1966; Sorkin, 1972), and their dispersion among other professions was lower than was that of the majority group (Bock, 1971).

TABLE 2.—*Occupational status of white and nonwhite women, 14 years of age and over: 1910, 1960, and 1970 (percentages)*

Occupational category	1910		1960		1970	
	White	Nonwhite	White	Nonwhite	White	Nonwhite
Professional and technical	11.6	1.5	14.1	7.7	15.5	10.0
Managers, officials, and proprietors (except farm)	1.5	.2	4.2	1.1	4.7	1.4
Clerical and sales	17.5	.3	43.2	9.8	43.4	21.4
Craftsmen and foreman	8.2	2.0	1.4	.7	1.1	.8
Operatives	21.2	1.4	17.6	14.3	14.5	16.8
Nonfarm laborers	1.5	.9	.5	1.2	.4	.9
Private household workers	17.2	38.5	4.4	38.1	3.7	19.5
Service workers (except private household)	9.2	3.2	13.1	23.0	15.1	28.5
Farmers and farm managers	3.1	4.0	.5	.6	.3	.2
Farm laborers and foremen	9.0	48.0	1.0	3.5	1.3	.3

Source: A. L. Sorkin, Education, Occupation, and Income of Nonwhite Women, *Journal of Negro Education*, 1972, 41, 345, table 1.

LEVELS OF ASPIRATION

As a recent reviewer of the literature on occupational aspirations (Kirkpatrick, 1973) has noted, the interaction of race, age, social class, sex, and geographic locale complicates the picture of racial comparisons; the failure of investigators to consistently control for these variables has produced a body of research from which it is difficult to draw generalizations. In the following section two kinds of recent aspiration research will be reviewed briefly: studies in which sex differences were apparently not examined, and studies in which sex of respondent has been controlled. The former are cited in part for the rare comparisons they provide of several minority groups. Only those studies that have controlled for class will be considered.

STUDIES THAT FAILED TO CONTROL FOR SEX OF RESPONDENT

Cosby (1971) drew a sample of 5,992 black and white 10th grade students in the Deep South so as to obtain a heterogeneous group with respect to social class. He found that whites had higher levels of aspiration when class was not controlled, but that within similar socioeconomic groups blacks displayed higher levels in the majority of comparisons.

Though he does not say so, Phillips (1972) probably drew his Mexican American, white, and black fourth grade subjects from the Southwest. The investigator measured both desire for academic achievement and desire for peer and teacher acceptance. Blacks were found to have the highest hopes for social acceptance and academic achievement, while Mexican Americans, like upper lower class whites, appeared to want social acceptance more than they wanted academic recognition. Middle class whites wanted achievement recognition more than social acceptance. One of the weaknesses of this interesting study is the author's apparent failure to measure class among the black and Mexican American subjects. Bell (1965) found that two groups of lower class black mothers held significantly different educational and occupational aspirations for their children, on the basis of their relative class positions. (Though both groups were lower class, one group was of a higher status than the other.) Thus class differences, at least within the black group, appear to be important determiners of aspiration even when the class differences are small.

An investigation of Mexican Americans, whites, and blacks living on the West Coast provides partial support for Phillips' findings. Hindelang (1970) found that black fourth, fifth, and sixth grade pupils indicated higher educational aspirations than did whites (92 percent vs. 85 percent, respectively, said they wished to finish college) or Mexican Americans (71 percent). The investigator attributes some of the racial differences in aspiration to differences students perceived in their parents' desire to have them attend college. Mexican Americans expressed the lowest (53 percent) perception of their parents' wish to see them receive a college education. The lack of significant differences between the three groups with respect to jobs they wished to acquire suggested that blacks desired more education than was necessary for their educational aspirations. (It is not uncommon for blacks to be overeducated for the work they actually perform.) Interestingly, *only* black children believed their teachers were prejudiced against members of their racial group. Even if the Mexican American children erred, these findings suggest that they are psychologically less burdened by the effects of racism than are black children.

The only study within this group to find whites' aspirations higher than those of minority groups was reported by Antonovsky (1967). In a northern metropolis he found white middle class children had higher aspirations and expectations than did middle class black or Puerto Rican children, or than lower class children of the white, black, or Puerto Rican groups. Lower class Puerto Rican children were at the lowest levels.

STUDIES THAT CONTROLLED FOR SEX DIFFERENCES

Carter, Little, and Barabasz (1972) found that neither sex nor race distinguished the aspirations of black and white seventh and eighth graders (enrolled in the University College

Buffalo Campus School). Social class served as a covariate.

Thorpe (1969), who also controlled for class, found that both race and sex determined aspiration, with black girls expressing higher aspirations than white girls or black boys. The sample was composed of 1,493 North Carolina high school students.

Finally, in a study more sophisticated than most in this area, Picou (1973) attempted to develop a causal model of aspiration that would relate social class, academic performance, and sex to occupational aspiration. The sample was composed of 915 Louisiana youth classified as "rural," which was in fact a subsample of a proportionate, stratified, random cluster sample of high school seniors. Using a statistical technique that is a variant of multiple regression analysis, he found academic performance exerted the strongest effect upon occupational aspiration for both blacks and whites. Interestingly, while the socioeconomic variables of father's occupation and education manifested the largest correlations with aspiration for the white sample, for blacks family income was more highly correlated with aspiration. (This attests to the centrality of the black mother's employment, certainly for the economic benefits that accrue, but perhaps for other, more psychological benefits as well.) Mean aspiration scores were highly similar for black and white youth. Finally, the model that related socioeconomic factors, sex, and academic performance to aspiration accounted for the formation of occupational aspirations of white youth more successfully than of black. While for white youth 22 percent of the variance was accounted for by these factors, the same variables accounted for only 8.5 percent of the occupational aspiration variance of black youth. Clearly, other variables determine aspirations for both blacks and whites, but this is particularly the case for blacks. The possibility of different motivational structures for the two groups will be examined elsewhere in this paper.

SUMMARY

Four of the seven studies reported above found educational or occupational aspirations, or both, higher for blacks than for whites when socioeconomic status was controlled. It is clear, then, that to whatever extent hopes and desires determine occupational attainment (and there is some indication the relation is weak), it is not the absence of wanting that denies blacks equitable employment levels. However, for Puerto Ricans and Mexican Americans and for the lower classes of all racial groups, lowered aspirations, particularly for academic recognition, may be a detriment to the attainment of certain kinds of jobs.

It appears that research has amply demonstrated comparable levels of aspiration and that few additional studies are warranted, at least if the targets of comparison are blacks and whites. Even for Mexican Americans and Puerto Ricans, however, it seems unlikely that insufficient striving is a major reason for occupational inequities. Rather, occupational attainment and its antecedents appear more in need of exploration than does occupational striving. Certainly it is implicit in such investigation that failures of attainment are being attributed more to the victims than to the institutions—unions, industry, and schools—that have brought about the victimization. Nonetheless, it would be naive to deny that racism has been effective in producing some of the very psychological characteristics that are then used as evidence of inferiority and unemployability.

Hence it is important that research come to include the intervening variables that may mediate occupational aspiration and attainment. Picou (1973) provides interesting data with respect to academic performance. Another variable of importance is undoubtedly that of locus of control. Gurin and Katz (1966) found that a sense of high personal control was related to aspiring to occupations more demanding of ability, more prestigious, and, for men, less traditional for blacks. Lao (1970) found that black students with higher personal control scores performed better academically, were more academically confident, and had higher educational expectations. Interestingly, Beasley (1967) found white students believed their occupational choices were a function of their personal preferences, whereas black students apparently believed choices were beyond their control. With-

out attempting to adequately review the internal-external control dimension in relation to aspiration or, more importantly, in relation to occupational attainment, it becomes clear that this variable is a significant one in determination of occupational choice and, it is suspected, of occupational attainment as well.

LIFE CAREER EXPECTATIONS AND PREFERENCES

The first question asked was the broad one of whether black and white women resembled one another with respect to their stated desires and expectations for work. Inspection of data from three sources revealed significant differences in desires for employment, realistic expectations, and projected employment patterns. Information about what the two groups of women wanted (see table 3) was derived from Fichter (1967) and Kuvlesky and Obordo (1972). Though the two studies reveal different patterns of response within each racial group, it is nonetheless striking that the proportion of black women who wished to combine full-time employment with the traditional roles of wife and mother was roughly twice that of white women who desired this option, irrespective of investigator. Concomitantly, the ratio of white to black women who wished to be homemakers was almost 2 to 1 in both samples.

It is possible that the differences between the two studies derive from the populations sampled. Kuvlesky and Obordo administered questionnaries to high school sophomores in three rural, largely low-income counties of Texas. One might speculate that the age of the subjects, their place of residence, and their socioeconomic status would militate against career strivings. Fichter's population of southern college graduates was older, undoubtedly more urban, and probably of higher social status. (Though the social class of black college students is lower than that of white college students, Gurin and Katz [1966] found the educational and occupational levels of their 4,000 black students higher than those of a comparison group of southern and national nonwhites.) Thus the fact that 47 percent of black college seniors desired full-time

TABLE 3.—*Life career preferences of black and white women (% by investigator)*

Career preference	Investigator	Race	
		Black	White
Homemakers: work not at all or only before birth and after growth of children	Fichter[a]	37	64
	Kuvlesky & Obordo	45	80
	NORC (Fichter)[b]		63
Work occasionally throughout	Fichter[a]	11	10
	Kuvlesky & Obordo	28	10
	NORC (Fichter)[b]		12
Combine full-time work with marriage and child rearing	Fichter[a]	47	24
	Kuvlesky & Obordo	27	10
	NORC (Fichter)[b]		21

[a]Subtotals for categories given by Fichter do not sum to 100 because of the exclusion in this table of respondents indicating a desire for career without marriage or without children.

[b]Refers to data gathered by the National Opinion Research Center's study of approximately 10,000 1964 graduates nationwide, reported by Fichter.

NOTE.—Data for this table were derived from Fichter (1967), who studied approximately 2,000 black and 2,000 white 1964 graduates of southern colleges and universities, and Kuvlesky and Obordo (1972), who examined 99 black and 134 white subjects in rural Texas. The investigators asked somewhat different questions necessitating reformulation of categories in what appeared to be equivalent terms.

employment and families while only 27 percent of black rural high school students wanted this combination seems reasonably accounted for by the value differences associated with region, age, and class. Both black and white women seemed to respond to these influences, which depressed the scores of Kuvlesky and Obordo's sample but did not change the ratio of black to white responses.

The pattern for career expectations parallels that for aspirations. Table 4 reveals that in three of the four studies cited, 3 times as many black women expected to work full time while raising children (in Fichter's study the ratio was 2 to 1) and, similarly, that in three of the four studies 2 times as many white women expected to be homemakers.

The differences in employment preference and expectation between black and white women are not simply a function of a greater desire to work on the part of black women: what is apparent is a difference in the pattern of employment. White women want and expect to absent themselves from the labor market while they have children: 50 and 55 percent of the white respondents in Fichter's report and 61 percent of the white subjects in Kuvlesky and Obordo's study preferred this pattern, whereas only 29 percent of the black women in the former study and 36 percent in the latter preferred it.

Given the nature of these differences, some mention of the respective subjects' attitudes toward children is relevant. It was not that black women wanted children less: Kuvlesky and Obordo found no differences between blacks and whites in the number of children desired, and Fichter found black men and women expressed a greater desire to have children than did whites of either sex. (Though these were stated desires, it should be noted that black women with 4 years or more of higher education have the lowest fertility rates of any group of women, including women with similar educational backgrounds [Jackson, 1973]. This low rate may be due in part to the low ratio of black men to black women; while there were 95.3 white males

TABLE 4.—*Life career expecations of black and white women (% by investigator)*

Career expectations	Investigator	Race	
		Black	White
Homemakers: work not at all or only before birth and after growth of children	Fichter[a]	24	57
	Kuvlesky & Obordo	46	73
	NORC (Fichter)[b]		63
	Turner	21	53
Combine full-time work with marriage and child rearing	Fichter[a]	40	19
	Kuvlesky & Obordo	18	6
	NORC (Fichter)[b]		14
	Turner	54	16
Combine part-time work with marriage and child rearing	Fichter[a]	19	18
	Kuvlesky & Obordo	36	21
	NORC (Fichter)[b]		17
	Turner	25	31

[a]The investigator does not account for the fact that the subtotals sum to less than 100 percent. (Some respondents are excluded from this table because they plan either not to marry or not to have children.)

[b]Refers to data gathered by the National Opinion Research Center's study of approximately 10,000 1964 graduates nationwide, reported by Fichter.

NOTE.—Data for this table were derived from Fichter (1967), Kuvlesky and Obordo (1972), and Turner (1972), who examined 28 black and 45 white freshman women at the University of Massachusetts (see note, table 3).

to every 100 white females in 1970, the corresponding ratio for black men and women was 90.8 to 100. Accordingly, in 1970 there were more single, divorced, and widowed black women than white [Jackson, 1971].) Since the concern here is with attitudes, it seems safe to conclude that black women believe the roles of wife and mother are more compatible with occupational roles than do white women.

OCCUPATIONAL CHOICES: THE FIRST PARADOX

Given the above-described black pattern of preferences and participation in the labor force, one might predict similar nontraditionality in occupational choices. In comparison with white women, precisely the opposite occurs. Before examining these data let us consider some myths. Much has been made of the black woman's professional role since Moynihan (1965). Bock (1971), in support of Jessie Bernard's notion of "unnatural superiority" of the black woman, points out that black women constituted 60.8 percent of the black professional class in 1960, whereas white women constitute only 37.2 percent of the white professional group.

Thus, in comparison with black men, proportionately more black women were physicians and surgeons, lawyers and judges, accountants and auditors, than were white women in comparison with white men. This greater representation has occasioned considerable debate over what should be done about the black woman's greater "progress" in relation to her man. Whether this concern is motivated by sexist or racist reasons, it is misplaced. The point is that black men are woefully underrepresented in the professions, not that black women are overrepresented. In fact, in 1970 only 10 percent of the black women in the labor force were professionals, while 15.5 percent of the white women were so designated. Further, the earnings of nonwhite women were still only 60 percent of those of nonwhite men in 1970, though this relation might not hold at the professional level.

It is possible that black women have encountered less job discrimination than black men, particularly at professional levels of employment. For instance, Sorkin (1972) points out that though the educational gains of black men and women were comparable in the period 1952-1970 (3.9 years and 4.0 years respectively), black men in comparison with white men lost ground at the professional and managerial levels during the same period (Bock, 1971). And, while the incomes of highly educated black women actually exceed those of highly educated white women (in 1970, according to Sorkin, black women with 16 years or more education earned 129 percent as much as white women at that level), the incomes of black men are less than those of white men at *all* levels of schooling.

(One can only speculate about the cause of this discrepancy between black men and women. As Sorkin suggests, it is possible that nonwhite women were hired more readily than nonwhite men, as employers sought compliance with the 1964 Civil Rights Act, because they could be hired at *lower* salary levels. Nonwhite women are also attractive because they may be counted twice in affirmative action reports. Finally, it is to be noted that about 54 percent of all black women classified as professional are teachers, in comparison with 39 percent of white women, and in 1970 black women teachers earned $1,400 more than their white counterparts. Thus much of the black woman's comparatively higher earnings may be a function of her employment in the most traditional of female occupations and, according to Sorkin, of her more *continuous* employment within this occupation, resulting in greater seniority. The relative income advantage of professional black women in comparison with white women is not so clearly indicative of less discrimination encountered by her than by the black male.)

It would seem not so much that the black woman's professional representation is superior, but that the black man's professional representation is inadequate. The "superiority" of black women is finally called into serious question when the nature of her professional participation is examined.

Within the professional class, black women are concentrated in fewer professions than are black men, white women, or white men. Not only is their dispersion smaller; the occupations they

hold are traditionally more feminine than those of any other group. Summarizing the occupational choices of the Gurin and Katz 1966 sample of black college women, these reviewers found 88 percent were choosing such traditional fields as elementary and secondary school teaching, clerical jobs, nursing, and occupational therapy. Berman (1972) obtained occupational choices for 545 black, Puerto Rican, Chinese, and white female graduates of a public high school in New York City. In that study he found occupations traditional for women had been chosen by 73.5 percent of the black students, 78 percent of the Puerto Rican, 52 percent of the Chinese, and 66.8 percent of the white. Though the nontraditionality of Chinese occupational choices is noteworthy, the traditionality of black choices supports what has been reported elsewhere. (Findings with respect to the Chinese women should not be construed to mean that they are not subject to the same constraints as other women. Asian American women feel their culture grants them *less* freedom than is accorded the white woman. Their choices reflect cultural patterns that obtain even more for men than for women. See *Journal of Social Issues*, 1973, 29.)

Even more illuminating of the constraint sex manifests on occupational choice for black women are the findings of Gurin and Katz with respect to the correlates of what it was that made an occupation desirable. A subsample of same-sex peers rated the desirability of the various occupations. Among black males, the choice of what was desirable occupationally tended to be related to how demanding of ability the occupation was (r = .64), to how difficult it would be for a black in comparison with a white to enter the occupation (r = .58), and to how nontraditional the occupation was for blacks (r = .61). Among the girls, however, occupations that had been deemed desirable were *negatively* related to the same variables. For girls, a desirable occupation was one that was *not* demanding of ability (r = −.31), *not* difficult for a black to enter (r = −.12), and less traditional (r = −.16). Thus,

> If choices that are deemed desirable by like-sexed peers are considered "role-appropriate" choices, the picture emerges that for a girl to have high aspirations, to choose a nontraditional occupation or one demanding a great deal of ability, simultaneously means she is making an "inappropriate" choice for a woman. High aspiration in the occupational area seems to be inconsistent with femininity . . . [Gurin & Katz, 1966, p. 97].

Finally, Gurin and Katz found that "most high status [social class] characteristics seem to encourage conventional but undemanding occupational aspirations for girls [p. 109]."

This constriction of choice appears to begin early, as the women initially considered fewer occupations that were demanding, nontraditional, and prestigious than did the males. They also made their choices earlier and were more certain of them. These data are congruent with the investigators' findings that women thought a career would be less important after college than did men, and that they gave little thought to advancement or career development.

It is not clear to the reviewers whether young black women are *more* constricted in their occupational desires than are young white women. We know that in fact they enter fewer occupations, but Fichter (1967) found high similarity between his black and two white samples in occupational choice, with 65 percent of the blacks and 60 and 63 percent of the whites choosing education or social work. Gurin and Katz concluded that black girls in their sample were highly similar to women generally. Whether more constricted or not, it is clear that they are no *less* constricted than their white counterparts, in spite of their stronger work orientation. The paradox, then, is that though black women are not as constricted in their conception of the feminine role, in that they see marriage and child rearing as compatible with employment, they nonetheless seem to be at least as constricted as white women in their conception of what occupational roles are appropriate for them.

MOTIVATIONAL ANTECEDENTS IN BLACK WOMEN

No attempt will be made here to fully review the motivational literature extant with respect to black women. The discussion will rely primarily on the work of Turner (1972) and Gurin and Katz (1966). Briefly, the latter found that

achievement orientation in men was positively related to aspirations that were demanding of ability and that were prestigious. When women aspired for jobs demanding of high ability, they did so for much the same motivational reasons as did the males. But, as pointed out above, fewer women so aspired. Thus, although the investigators believed it unnecessary to postulate different sets of motivational factors for women and men, it is clear that more of the variance of the women's actual occupational choices might have been accounted for had additional apparently relevant variables been included in the research.

Turner (1972) suggests what some of these variables might be. In her study of 28 black and 45 white female sophomores attending the University of Massachusetts, she identified high and low career expectation (CE) groups within both races. For each race independent multivariate analyses of variance were performed in order to identify the demographic, attitudinal, and developmental variables that discriminated the high from the low CE groups. Strikingly, no overlap of predictors occurred—the variables that discriminated high from low CE groups were entirely different for the two races. Among the whites, high career expectations appeared to be related to (1) parental stress of competitive values during the student's childhood, with a deemphasis of correct and obedient behavior; (2) equalitarian attitudes toward male and female roles; and (3) a higher incidence of separation and divorce among parents. For the black women, however, high career expectations were related to what appeared to be the students' perceptions of the expectations and desires of significant others. The high CE group thought that most of the men they knew preferred, and that their mothers expected, more work involvement for their wives and daughters respectively. High scores were also somewhat related ($p < .072$) to an appreciation of parental strictness. Interestingly, Turner found that 54 percent of the black women wanted less work involvement than they expected, whereas 40 percent of the white women wanted more.

What Turner suggests is that black subjects' high expectations for work derived not so much from an achievement ethic as from a sense of responsibility. This conclusion has certainly been reached by others: Scanzoni (1971) says that the black woman works because she has to; Hill (1972) points out that white families have higher incomes than do black families even when only the male is employed; Batchelder (1964) reminds us that in the late 19th century black women in the North often provided the only family income, since they were hired as washerwomen when no one would hire their husbands. The point made here is that as far as is known Turner's data provide the first psychological support for this conclusion. Further, as has been suggested earlier, more than economic necessity may be operative in the black woman's employment: black women appear to have internalized what was and remains a necessity in such a way that they view their role as family member differently than do white women.

These attitudes are reflected in two dimensions. First, we propose that black women see themselves as more competent and able than do their white counterparts. Fichter (1967) noted the black women in his sample were significantly more confident of their own abilities than were the whites. For each of eight selected occupations, blacks were less likely than whites to profess that they lacked the ability to perform the stated work. White women were also twice as likely to say that they lacked the proper personality for the occupation. Epstein (1972) also noted a greater level of self-confidence in her sample of black professional women than she had in a sample of white professional women.

The second corollary derives from what it means to have to meet not only the expressive expectations and needs of others, but instrumental needs as well. In a culture that has limited the woman's role to the former, the necessity of performing both roles has, we believe, been burdensome. This sense of burden is somewhat attested to by the number (54 percent) of black women in Turner's sample who wanted less work involvement than they expected (it is to be remembered that 40 percent of the white sample wanted more). Employment for the black woman has come about not so much from a desire for personal fulfillment as from existing in a society which in preventing her mate from achieving manhood (as culturally defined) has demanded

she be more than a "woman." It is not that she has lacked fulfillment or satisfaction, but that their occurrence has been more accidental than sought.

SEX-ROLE ATTITUDES

In a study of 77 black and 40 white college women, Gump (1972) found highly significant differences between the two races in their endorsement of the traditional feminine role. Black women were much more likely than white women to endorse the position that a woman's identity derived primarily from marriage, that a mother with children should remain in the home, and that a woman should be submissive in relation to men. (Three of the four statistical comparisons were significant beyond the .001 level.) It is important to note that the black women's belief in the importance of maximizing their own potential was *equal* to that of the white women. The difference between the black and white women derived, then, from the latter's much greater adherence to this progressive view. Black women were balanced in their espousal of the two views. The white respondents were more interested in achieving fulfillment for themselves than in fostering the achievements of their children and husbands at their own expense. These findings were replicated in a larger study of black and white college women (Gump, 1972).

THE COMPOSITE PORTRAIT

Many data have been presented that portray the black woman as more likely to enter the labor force than the white woman, more interested in doing so, more likely to work full time and continuously, and more necessary to the financial welfare of her family. Consonant with these findings are those of Weston and Mednick (1972), who found significantly more fear-of-success imagery in a white sample of college women than in a black. (The investigators also mention partial replication of these findings with additional samples.) While such facts suggest a woman much less constricted by the traditional role than her white counterpart, they represent an incomplete portrait, for it is equally true that black women choose occupations traditional for women, are motivated perhaps more by a sense of responsibility than by achievement need, are much more traditional in their sex-role attitudes than are young white women, and to some extent seem burdened by the responsibility they carry.

Thus it appears that black women have *not* escaped many of the constraints imposed on white women, though they are free of some of them, and that concern for the occupational options of women can be directed no less toward them than toward any other women. For there are those who would assert too quickly the freedom of the black woman, and they must be reminded of her bondage. If black women have not been subordinated, neither have they been cherished; if they have not been limited, neither have they been protected. If they have gained independence, they have done so at the great price of too little dependency.

TECHNICAL CONSIDERATIONS

Twenty years ago Thurstone (1955) made a distinction between tests and questionnaires: "The questionnaires are also called inventories, schedules and self-appraisals. None of these are tests in any real sense." Lawshe and Balma (1966) enlarged on this distinction: "Measurement of temperament and interest and self-report devices of all types are referred to as inventories or questionnaires, not tests. The term 'test' is reserved for measures of maximum performance." According to these writers, instruments such as the Strong Vocational Interest Blank (SVIB) and the Kuder interest inventories do not qualify as psychological tests in the true sense.

In addition, there is ample evidence to indicate that little relation exists between abilities and corresponding interests (Darley & Hagenah, 1955; Perrone, 1964). The degree to which interest and aptitudes are correlated is at such a low level that it is not possible to predict one from the other with a reasonable degree of accuracy (Womer, 1961). Nevertheless, instruments such

as these are used extensively in assessment and guidance situations that involve examinees from the total spectrum of American life, in both educational and vocational settings.

Interest inventories are of little practical value by themsleves; when they are considered together with aptitude and achievement patterns, however, they can be useful aids for helping *certain students* select a career pattern or course of study. The major question is whether minority female students fit into this class of examinees.

PAUCITY OF DATA

Strong (1943), in one of his minor studies, reported that the only interest data pertaining to black females were those furnished by a study at Meharry Medical College of 25 black women, average age 20.3 years, who had averaged 2 years of postcollege work. The women were scored on the then-current women's interest scale for nurses at the beginning of their training in this field. It was found that their average score was superior to that obtained by the 1946 criterion group of white nurses, and that 92 percent rated A compared with only 71 percent of the criterion group.

None of the revisions of the SVIB since the 1946 version have reported criterion data for groups of black females for any occupation. Campbell (1971) reported that for the 1946 women-in-general samples, a total of 7,819 females were examined. This group represented approximately 42 different occupational groups. The 1968 version used a sample of 1,000 women who represented 46 clearly defined occupational groups and an additional 100 adults and 68 high school students from miscellaneous sources. A revision of the women's form was completed in 1969. This involved several structural changes in the instrument and an updating of the item array. Approximately 58 occupational groups are listed in Campbell's descriptions of the women's criterion groups. The degree of black female representation in the women-in-general or the criterion groups is not indicated in his handbook or in the manuals for the various revisions.

PROBABILITY OF MISMATCH OF INTEREST

One could conclude from the lack of data pertaining to the inclusion of black female samples in the more recent revisions that no attention was given to the assessment of the interests of black women in the occupational groups covered by the SVIB. On the other hand, one may conclude that there are insufficient numbers of black women in the occupations covered to obtain any meaningful sample size. In either case, the black female student who takes this interest device is penalized. Her responses will be compared with the responses of white examinees whose interests have been shaped by the same forces that shape the interests of the women in the validation groups. A black woman is thus faced with a mismatch of interests.

The ACT *Handbook for the ACT Career Planning Program* (1972) reported special subgroup norms (Afro-American, Mexican/Spanish American) for vocational interest profile scales. Norms for Mexican/Spanish American females were not available because of insufficient sample size. An examination of these norms shows that there is a tendency for black students, when compared with a general norm group at the vocational entry level, to score higher on all the interest scales except trades. A similar pattern emerges from the norms presented for the Mexican/Spanish American students, although less extreme than for blacks.

Of special interest to our present discussion of technical factors is the cautionary statement that accompanies the norms presented in the ACT *Handbook*. It is pointed out that these subgroup norms must be used with caution because students in various subgroups have had diverse educational experiences. Students from culturally different backgrounds may not have had educational opportunities or life experiences comparable to those of persons whose scores constitute the general normative group.

Deutsch (1964) suggested that when standardized interest inventories are used, special caution should be observed in making normative interpretations of scores of individuals who are members of minority groups. Anastasi (1968) suggested that the validity of a test for a particular criterion may differ from group to

group; the test may be a better predictor for a person with certain characteristics than for other persons. For example, an instrument may be a better predictor for boys than for girls, or for white than for black adolescents. In both instances sex and race are moderator variables.

A variety of moderators have been identified. Saunders (1956) pointed out the presence of such demographic variables as sex and socioeconomic status as moderator variables. Hobert and Dunnette (1967) demonstrated the utility of moderators in selecting managers. Rock, Evans, and Klein (1969) identified the level of parents' interest in students' hobbies, sociability, socioeconomic status, and level of interest in school as potential moderators.

Our basic contention in regard to interest inventories used with minority women is that there may be a discontinuity or mismatch between the interest structures developed from the background of minority females and those of the criterion groups used to validate an interest scale. This notion implies that both the predictor (inventory) and the criterion (reference group) are biased against the minority female, both from the standpoint of sex and from that of ethnic membership. The background experiences of the minority female force her to develop an array of expressed interests different from those developed by white men and women. It is possible that the development of scales for women may partially alleviate the discrepancies that exist in the use of scales based on the interests of white men; however, more attention needs to be given to the mismatch between the interests of minority women and the interests of white women used in the criterion groups.

The major indication of most research evidence is that tests used in making employment decisions should be considered unfair to disadvantaged minorities unless there is creditable contrary evidence. Kirkpatrick, Ewen, Barrett, and Katzell (1968) studied four different jobs for evidence of test unfairness toward blacks. They concluded that test fairness is a specific problem that needs to be researched in the particular situation, and that the issue of fairness hinges on the nature of the sample, the criteria, and the tests.

An event reported by Williams (1972) illustrates this point. In a West Coast city, 100 minority postal employees were hired in spite of low scores on their screening tests. At the end of 1 year they were all given *excellent* ratings based on job performance. At that point the screening tests were readministered to them; they all failed. The tests did not predict the employees' ability or interest in throwing mail.

EFFECT OF MODERATOR VARIABLES

A possible solution to this state of affairs may come from the work of Droege and Miller (1969). They attempted to develop a measure of cultural exposure level that could be used as a moderator of test validity. The use of such a measure would theoretically obviate some of the practical difficulties of taking ethnic membership into account in adjusting test scores. This measure should be investigated in regard to its applicability to existing interest instruments.

Lykken and Rose (1963) called the moderator variable Z and further suggested a formula that seems particularly appropriate to our discussion: "The predictability of Y from X varies as a function of Z, although Z may be uncorrelated with Y or X [p. 142]." From this we can derive the following equation:

Let X = interest inventories (predictor variables)
Y = scores of reference group (criterion variables)
Z = bias (moderator variable)

The moderator variable (Z) may be characteristic of the person, of the inventory, or of the criterion. Motivation, race, sex, and socioeconomic status (SES) can be classified as *person* characteristics, whereas factors such as bias and unfairness can be classified as inventory and criterion characteristics. Theoretically, if we use bias as a moderator for both predictor and criterion variables, several interesting matching and mismatching patterns emerge. These are presented in table 5.

TABLE 5.—*The effect of Z (moderator) present or absent on correlation (Williams, 1972)*

Predictor (*X*)	Criterion (*Y*)	Match	Expected correlation
1. *Z* absent	*Z* absent	Yes	High
2. *Z* present	*Z* absent	No	Low
3. *Z* absent	*Z* present	No	Low
4. *Z* present	*Z* present	Yes	High

We shall briefly concern ourselves with two of the conditions (1 and 4) presented in the table:

1. Z absent in both X and Y. Because *Z* is absent, both the predictor and the criterion variables are presumed to be fair for the intended population. The women's version of the SVIB—now superseded by the unisex Strong-Campbell Interest Inventory (SCII), though the women's form is still in use—is a fair inventory for white women, since it was standardized on a white female population. That is, we would expect *Y* (the criterion) to be easily predicted from *X* (the predictor) because of the match (similarity of the basic factors in the predictor and criterion variables). Under *Z*-absent, or fair, conditions, interest inventories do what they are expected to do—predict to the criterion-group interest structure.

4. Z present in X and Y. If *Z* is present in both the predictor and the criterion, the correlation tends to be high. The bias in the inventory and the criterion will lower the scores. If a minority female scores low on the inventory, she is less likely to have an interest structure approximating that of the reference group. For white females, for whom *Z* is absent when they are compared with female criterion groups or female norms samples, the inventories are fair and the criterion is fair; that is, a matching situation exists. For minority females (who were not included in the standardization or criterion sample and for whom *Z* is present) the inventories and the criterion are unfair—also a matching situation.

CONCLUSION

We have presented this brief examination of some of the technical aspects of the problem of preparing assessment instruments for minority-group examinees in order to emphasize the need for further work in this area. A massive amount of controversy has centered on the appropriateness of standardized psychological tests and inventories for minority-group individuals. It is our opinion that the future of employment and educational testing will depend for the most part on the vigor of future research efforts into proper techniques for the validation of these instruments for minority-group students. The major obligation of instrument validation is the professional responsibility of the psychologist, and it is to this group of professionals that the following recommendations are made. The technical knowledge is available and there has been a start in minority test validation (Williams, 1972).

GUIDELINES FOR INTEREST INVENTORIES USED WITH MINORITIES

1. Efforts directed at amelioration of sex bias should be extended as strenuously toward members of minority groups as toward whites. In the first section of this paper it was suggested there may be a need to counteract explicit and implicit attitudes that black women do not require guidance that would lead them to expand vocational options. Through minority participation in the NIE workshop, and through attention given to predominantly black and Spanish high schools, NIE may play an important role in educating counselors to be sensitive to the needs of minority women.

2. Given the tendency of black women to make early career decisions within a limited array of occupations, to the extent that interest inventories may be used as sources of stimulation their early administration is thought to be particularly important for the minority student.

3. Student handbooks should include accurate information about the proportions of minority men and women in various occupational roles, so that occupational planning may include realistic knowledge of group participation.

4. Counselor manuals should also include discussion of group participation in various occupations, and counselors should be urged to encourage the minority student's broad consideration of occupational choice, even where present numbers of minorities in given roles are low. Low participation has too often been used as a source of discouragement. Where the student's interests and abilities are realistically matched, counselors should be advised to admit their ignorance of "how it would be" for the minority student entering uncharted waters, rather than to "protect" him or her from contemplated difficulties.

5. Publishers should establish response rates on homogeneous scales for minority men and women. Should substantial differences in response be found, separate norms should be presented for different minority groups. Should differences not be found, publishers should indicate clearly that differences were evaluated and that groups have been combined according to similarity of response.

6. Criterion groups for occupational scales should be examined to determine if minority groups are included, and where minorities are included their response patterns should be compared with those of the majority and item modifications made where necessary.

7. Minority-group psychologists should seek Federal, State, and private support for developing new instruments that are appropriate for use with minority-group women.

REFERENCES

American College Testing Program. *Handbook for the ACT Career Planning Program.* Iowa City: Author, 1972.

Anastasi, A. *Psychological testing,* New York: Macmillan, 1968.

Antonovsky, A. Aspirations, class and racial-ethnic membership. *Journal of Negro Education,* 1967, **36**, 385-393.

Batchelder, A. B. Decline in the relative income of Negro men. *Quarterly Journal of Economics,* 1964, **78**, 525-548.

Beasley, J. A. A study of socioeconomic groups in relation to the ways they differ in attitudes toward various occupationel dimensions. *Dissertation Abstracts,* 1967, **28**(6-A), 2065. (Abstract)

Bell, R. R. Lower class Negro mothers' aspirations for their children. *Social Forces,* 1965, **43**, 493-500.

Berman, Y. Occupational aspirations of 545 female high school seniors. *Journal of Vocational Behavior,* 1972, **2**, 173-177.

Bernard, J. *Marriage and family among Negroes.* Englewood Cliffs, N.J.: Prentice-Hall, 1966.

Bock, E. W. Farmer's daughter effect: The case of Negro female professionals. In A. Theodore (Ed.), *The professional woman.* Cambridge, Mass.: Schenkman, 1971.

Campbell, D. P. *Handbook for the Strong Vocational Interest Blank.* Stanford, Calif.: Stanford University Press, 1971.

Carter, D. E., Little, C. A., & Barabasz, A. S. Comparative study of Negro and white attitudes associated with educational-occupational aspirations. *Journal of Negro Education,* 1972, **41**, 361-364.

Cosby, A. Black-white differences in aspiration among Deep South high school students. *Journal of Negro Education,* 1971, **40**, 17-21.

Darley, J. G., & Hagenah, T. *Vocational interest measurement: Theory and practice.* Minneapolis: University of Minnesota Press, 1955.

Deutsch, M. Guidelines for testing minority group children. *Journal of Social Issues,* 1964, **20**, 129-145.

Droege, R. C., & Miller, K. S. Development of a measure of cultural exposure. *Personnel Psychology,* 1969, **22**, 495-503.

Epstein, C. F. Positive effects of the multiple negative: Explaining the success of black professional women. *American Journal of Sociology,* 1972, **78**, 912-935.

Fichter, J. S. Career expectations of Negro women graduates. *Monthly Labor Review,* 1967, **90**(11), 36-42.

Ginsberg, E., & Hiestand, D. G. Employment patterns of Negro men and women. In J. P. Davis, *American Negro reference book.* Englewood Cliffs, N. J.: Prentice-Hall, 1966.

Gump, J. P. A comparative analysis of black and white women's sex-role attitudes. Paper presented at annual convention of American Psychological Association, Honolulu, 1972.

Gurin, P., & Katz, E. *Motivation and aspiration in the Negro college.* (Final report, U.S. Department of Health, Education, and Welfare) Washington: Government Printing Office, 1966.

Hill, R. B. *The strengths of black families.* New York: Emerson Hall, 1972.

Hindelang, M. J. Educational and occupational aspirations among working class Negro, Mexican-American and white elementary school children. *Journal of Negro Education,* 1970, **39**, 351-353.

Hobert, R., & Dunnette, M. D. Development of moderator variables to enhance the prediction of managerial effectiveness. *Journal of Applied Psychology,* 1967, **51**, 50-64.

Jackson, J. J. But where are the men? *The Black Scholar,* 1971, **3**(4), 30-41.

Jackson, J. J. Family organization and ideology. In K. S. Miller & R. M. Dreger (Eds.), *Comparative studies of blacks and whites in the United States.* New York: Seminar Press, 1973.

Journal of Social Issues, 1973, **29**(2).

Kirkpatrick, J. J. Occupational aspirations, opportunities and barriers. In K. S. Miller and R. M. Dreger (Eds.), *Comparative studies of blacks and whites in the United States.* New York: Seminar Press, 1973.

Kirkpatrick, J. J., Ewens, R. B., Barrett, R. S., & Katzell, R. A. *Testing and fair employment.* New York: New York University Press, 1968.

Kuvlesky, W. P., & Obordo, A. S. A racial comparison of teen-age girls' projections for marriage and procreation. *Journal of Marriage and the Family,* 1972, 34, 75-84.

Lao, R. C. Internal-external control and competent and innovative behavior among Negro college students. *Journal of Personality and Social Psychology,* 1970, 14, 263-270.

Lawshe, C. H., & Balma, M. J. *Principles of personnel testing.* McGraw-Hill, 1966.

Lykken, D. T., & Rose, R. Psychological prediction from actuarial tables. *Journal of Clinical Psychology,* 1963, 2, 139-151.

Moynihan, D. *The Negro family: The case for national action.* (U.S. Department of Labor, Office of Policy Planning and Research) Washington: Government Printing Office, 1965.

Perrone, P. A. Factors influencing high school seniors' occupational preference. *Personnel and Guidance Journal,* 1964, 42, 976-980.

Phillips, B. N. School related aspirations of children with different socio-cultural backgrounds. *Journal of Negro Education,* 1972, 41, 48-52.

Picou, J. S. Black-white variations in a model of the occupational aspiration process. *Journal of Negro Education,* 1973, 42, 117-122.

Rock, D. A., Evans, F. R., & Kein, S. P. Developing multiple criteria of creative achievements with moderator variables. *Journal of Educational Measurement,* 1969, 6, 229-235.

Saunders, D. R. Moderator variables in prediction. *Educational and Psychological Measurement,* 1956, 16, 209-222.

Scanzoni, J. H. *The black family in modern society.* Boston: Allyn & Bacon, 1971.

Sorkin, A. L. Education, occupation and income of nonwhite women. *Journal of Negro Education,* 1972, 41, 343-351.

Strong, E. K., Jr. *Vocational interests of men and women.* Stanford, Calif.: Stanford University Press, 1943.

Thorpe, C. B. Status, race, and aspiration: A study of the desire of high school students to enter a professional or a technical occupation. *Dissertation Abstracts,* 1969, 29(10-A), 3672. (Abstract)

Thustone, L. L. The criterion problem in personality research. *Educational and Psychological Measurement,* 1955, 15, 353-361.

Turner, B. F. Socialization and career orientation among black and white college women. Paper presented at annual convention of American Psychological Association, Honolulu, 1972.

U.S. Department of Commerce, Bureau of the Census. *United States summary: Detailed characteristics, 1970 census of the population,* Washington: Government Printing Office, 1973.

Weston, P. J., & Mednick, M. T. Race, social class and motive to avoid success. In J. M. Bardwick (Ed.), *Readings on the psychology of women.* New York: Harper & Row, 1972.

Williams, R.L. Abuses and misuses in testing black children. In R. Jones (Ed.), *Black psychology.* Harper & Row, 1972.

Womer, F. B. Tests: Misconception, misuse and overuse. *Michigan Journal of Secondary Education,* 1961, 2, 153-161.

Expanding Opportunities for the Reentry Women: The Use of Interest Inventories With the Mature Woman

/8

Mary Ellen Verheyden-Hilliard

SEX EQUALITY IN GUIDANCE OPPORTUNITIES PROJECT
AMERICAN PERSONNEL AND GUIDANCE ASSOCIATION

ABSTRACT

Because of the growing number of mature women reentering the labor market and the academic world, special consideration of their needs and concerns is becoming increasingly important.

Understanding how the mature woman's cultural set may affect her seemingly free choice of responses on an interest inventory, being aware that the cultural set of the counselor may affect the outcome, and being sensitive to possible sexist language, items, instructions, and interpretive materials in the inventories themselves can help counselors deliver even more effective guidance services.

The effects of the socialization process, which limits career expectations for girls and women, can be offset to some extent

by the counselor who is aware of and uses updated information on questions of home-career conflict, "appropriate" work for women, time and age factors, and what recent studies present as the new nonstereotypic profile of the reentry woman as student, member of the work force, family member, and achiever.

Expanded research on the needs of girls and women, the development of sex-fair counselor training materials, and sex-fairness preservice and in-service training for guidance personnel will be important in helping the majority of the population—40 percent of the work force—develop and utilize their full capabilities.

INTRODUCTION

> It is plain that opportunities for reentry women are, in the main, restricted to the traditional women's professions of teaching, nursing and social work; to work in offices and shops, in semiskilled or unskilled jobs in manufacturing, industry and in service occupations. The limitations which affect the employment of women generally, irrespective of age or marital status, are made more acute by the special problems of older women who have been absent from the labour market for a number of years. Under these conditions, many women fail to obtain the level of work of which they are capable, to their own and the community's considerable impoverishment. It is therefore important to examine the critical factors affecting reentry women's access to jobs and their chances of obtaining and retaining work at a level appropriate to their capacities [Seear, 1971, p. 17].

A counselor has an appointment to give an interest inventory to a women who is 45 years old, a college graduate whose children are in secondary school. Also waiting is a woman of 32. She is a high school graduate who wants to get a college degree. Her last child has just entered kindergarten. Down the street a personnel agency is administering an inventory to a 40-year-old woman who wants to get out of the secretarial job she has been in for 10 years. She is divorced and her children are in elementary school. Also waiting is a 50-year-old high school dropout who may be able to get a government grant for retraining if she finishes high school. She is presently taking care of her daughter's two preschool children while her daughter works.

What in the world is to be done with these women? Can they seriously be given interest inventories to any advantage? And if they do discover expanded interests, what good will it do? What college will take them? If they are accepted, where will they get the money to go back to school? What employer will hire them? They are unskilled. They lack updated tools. They are "too old." By the time they are retrained or reeducated, they will be even older. Anyway, what are they going to do with those children who are certainly their responsibility?

Still, there they are. Wanting to go back to school. Wanting to go back to work. Wanting meaningful jobs. Hoping the inventory will provide some direction.

The counselor and the personnel director have made the appointments. What are their responsibilities to these women? Does responsibility begin and end with the administering of the inventory plus a brief session to interpret the results? The test makers and publishers have sold their instrument to a consumer. What are their responsibilities to see that the test is sex- and age-fair—to help the counselors help the women make the best use of the information they receive from the inventory?

On the surface, the interest inventory offers an opportunity to indicate freely and without reservation where one's interests lie. Presumably neither reward nor punishment will follow one's expression of interest. It is a nonthreatening way for a person to simply indicate interests. Yet, in spite of the appearance of freedom of choice, there may be at least three overall factors limiting the choices that the woman makes or the use she is able to make of her choices.

The first factor may be the cultural set of the woman taking the inventory. Is she self-censuring her expression of interest (albeit nonconsciously) because of conflict between home and career, because she was brought up to believe only certain interests were appropriate for women, or because she considers it too late to make certain choices?

The second factor may be the cultural set of the counselor administering and interpreting the inventory. Is the counselor affecting the outcome of the interest inventory because of attitudes concerning the appropriateness of women working, the kind of work they do, or the age at which they begin?

The third factor may be the nature of the interest inventory itself. Does the content of the inventory—language, instructions, items, or other elements—create a limiting sex or age bias for the reentering woman? Does the counselors manual provide sufficient information on counselor attitudes and how these attitudes might affect the use of the inventory? Does the counselors manual provide sufficient information on the attitudes the woman may bring with her that may prevent an accurate expression of interests? Do the interpretive materials provide

the counselor and the woman with sufficient information on how she might proceed in order to make the best use of the score interpretation offered?

Answering these questions becomes increasingly important as one becomes aware of the numbers of mature women entering the work force and the academic world. The development in recent years of the Continuing Education for Women programs (Dolan, 1965), generally thought to be a white, middle-class phenomenon, is being further expanded by mature women of minority and poor groups also entering the colleges of America in ever-growing numbers (Miller, 1973). To consider the question of guidance materials for the mature woman an unimportant matter is no longer appropriate and will become increasingly less appropriate.

THE REENTRY WOMAN

> Compared to the social context within which a person lives, his or her history or "traits," as well as biological makeup, may simply be random variations, "noise" superimposed on the true signal which can predict behavior [Weisstein, 1970, p. 108].

SOCIALIZATION AND EXPECTATIONS

A basic consideration to keep in mind is that career development for women is hardly ever a matter of simple progression and growth as it generally is for men. Women are expected to give their energies only to maintaining the lives of their families rather than to creating lives of their own (Verheyden-Hilliard, 1973). Coser and Rokoff (1971) note that women live with a "cultural mandate [p. 538]" to give priority to the family even though they may be working. As Epstein (1973) concludes: "Somehow women are taught to consider anything inappropriate if it makes primary demands on their time and is not available for taping by others [p. 38]." Recognizing that women have been socialized to the belief that the needs of others always come first, we can begin to understand why a career for women is a matter of choice, and most probably a painful choice (Komarovsky, 1953). The choice involves double-standard decisions about whose career should have priority—that of the husband or that of the wife (Gray-Shellberg, Villareal, & Stone, 1972); about family responsibilities, time and money for training (Lyon, 1967); the recognition of the difficulties to be encountered in going against the traditional view of women's role (Lewis, 1968); and the realization that the choice, however painful, must be made over and over again as women's aspirations conflict with the desires and careers of their husbands (Leland, 1966). As Hawley (1971) noted, women tend to make career decsions based on their perception of what they think men will tolerate.

> Thus, while American society continually emphasizes equality of opportunity and freedom of choice, social pressures toward conformity to the sex-role stereotypes tend to restrict the actual career choices open to women [Broverman, Broverman, Clarkson, Rosenkrantz, & Vogel, 1970, p. 6].

The socialization to the sex-role stereotypes that later affects mature women begins early. As Entwisle and Greenberger (1970) have shown, ninth grade children, both black and white, when asked if wives should work showed the greatest disagreement between middle-class girls who said yes and middle-class boys who said no. The disparity was especially marked among youngsters of high IQ. What this suggests is that girls with the most intellectual capability to develop a career when they are grown are the ones most likely to meet opposition from their husbands. However, holding class and IQ constant, the black boys surveyed were more accepting than the white boys in their attitudes toward wives working.

Black men apparently carry the acceptance of women working into their adult life. Axelson (1970) found that over half of the black males in the sample did not object to a wife working if she wanted to, but fewer than half of the white males were willing to grant this freedom of choice. Other studies on younger men and women of minority and majority groups have indicated substantially the same thing (Kichter, 1972). Steinmann and Fox (1970), in a college-age study, found that black women perceive the

views of black men more correctly than white women perceive the views of white men—white women felt that white men wanted them to be primarily family oriented, whereas the white men said they wanted women to be both other- and self-directed. It is possible to hypothesize that white women may be interpreting and reacting to a deeper level of male attitudes than the Steinmann and Fox study picked up. For instance, Gray-Shellberg et al. (1972) found that the sample of college men in their study were "significantly more anti-feminist [p. 24]" than the noncollege sample. Lipservice to feminist views may not be the same thing as actually practicing those views in close, personal relationships. As Epstein (1973) notes:

> Girls are not only led to believe that they endanger their heterosexual relationships by aggressiveness in thinking, initiating and exploring, but they in fact encounter punishment by their male peers who may support their activity ideologically but reject them in favor of girls who make them feel important [p. 39].

Some adult women may also be restricting their abilities out of the same fear of the same kind of "punishment." It becomes not so surprising then to discover that when the Department of Labor (Hawley, 1971) surveyed 66,000 working women in 1966, only 4 percent worked in opposition to their husbands' wishes.

In the Farmer and Bohn study (1970) of 50 working women, 25 married and 25 single, all over 40 years of age, the level of career aspiration was raised when, on the second administration of the Strong Vocational Interest Blank for Women, the women were given instructions to "pretend" that men and women are promoted equally in business and the professions, that raising a family well is possible for a career woman, and that men like intelligent women.

To fault women for the ambivalence they have about careers for themselves and to ask "Why can't a woman be just like a man?" is like asking a black man of some years ago why he didn't just rise up and do something about his situation. To ask that question bespeaks a certain lack of understanding as to what socialization can do to self-concept. Interestingly enough, Hoffman (1972) cited a study of conformity and perceptual judgment in children (Iscoe, Williams, & Harvey, 1964) which indicated that black boys and white girls were influenced by others more than were black girls and white boys. The converging groups were not alike in sex or race, but they apparently did share the same environmental handicaps.

Black women's relatively greater participation in the work force in comparison with that of white women has historically reflected the need of the woman to take care of herself, and any others for whom she felt responsible, because of intense discrimination against black men. Perhaps because of the always present role model in the black culture of women working, black men have not seen that role for women as strange. Consequently when opportunities, however few, developed for black women at the middle and upper levels of occupations, black men and women saw this move as a step up to be taken advantage of rather than as a step out to be viewed as abandonment. As black men take their places in ever-increasing numbers at all levels of the heretofore all-white male occupational structure, it will be interesting to note whether they will be able to maintain their accepting attitude toward women working or whether they will adopt the present attitude of the majority male culture.

In regard to attitudes toward acceptable female role models, the comments of Eleanor Holmes Norton (1970), black civil liberties lawyer and New York City Human Rights Commission chair, may offer some insight to those who have a more traditional idea of women's "place":

> At the moment when the white family is caught in a maze of neurotic contradictions and white women are supremely frustrated with their roles, are black women to take up such troubled models? . . . Can it serve us any better than it has served them? and how will it serve black men? . . . On the road to equality there is no better place for blacks to detour around American values than in forgoing its example in the treatment of its women and the organization of its family life [p. 356].

Whether socialized to stay home to take care of children and working husbands or socialized to go to work to take care of children and husbands who are not allowed to work to their potential, women are serving the needs of some "other." The decision about how to proportion her life in regard to family and career has not rested with the woman, and the results of that

frustration are becoming increasingly visible in our society.

CHANGING ATTITUDES AND NEW EXPECTATIONS

> There I was, forty-five, my children on their own, my husband a success, and all I'd been doing for twenty years was making like a wife, mother and hostess. Nothing I'd been doing seemed important to anyone anymore. Everyone seemed to be telling me, "Go away, don't bother us. You're finished—die" [Westervelt, 1973, p. 7].

The attitude of the married, mature woman toward what society perceives as her "place" and her willingness to accept that perception as correct may be changing far more rapidly than we realize. Beyond, or in spite of, the limiting factors and concerns that affect the way women think about their role and that may limit their ability to use an interest inventory in a manner most beneficial to them, there appears to be something else surfacing in the literature that bears careful scrutiny.

In a study of gifted girls and women, Groth (1969) found that at approximately age 40, having filled the homemaker role for a number of years, women's intellectual needs, frustrated and suppressed since adolescence, rise to the surface and are expressed in need for self-actualization, recognition, and careers. Seifer (1973) reports that white ethnic working-class women working in and out of their homes are expanding their roles and seeking greater equality. A survey of blue-collar wives between the ages of 20 and 49 in eight metropolitan areas of Chicago revealed that one-third of the women showed an increased interest in careers for themselves and in community involvement outside their homes. In 1973 these women wanted only two children or fewer compared with 1965, when they wanted four (*Spokeswomen*, 1973). This changed attitude of the blue-collar wife prompted the chairman of the corporation doing the research to say: "Our society will never be the same again. The blue-collar woman comprises 60 percent of all women. She has spent decades as one of the most stable, unchanging groups in American society [p. 4]."

The Gray-Shellberg et al. study (1972) on the resolution of career conflicts is often cited to show that there is a double standard in regard to what is considered an appropriate occupational decision for a man or a women. Also contained in that study, however, are indications that marriage may be a factor in breaking down sex-role stereotypes and that "once women have experienced the ultimate goal that society has socialized them for, they are less completely motivated to forgo self-expression in favor of self-sacrifice [p. 17]."

The Hawley study (1971), which revealed that women's career choices were affected by women's perception of what significant men in their lives would think was an appropriate choice, also disclosed that women who were married tended to answer questions nearer the androgynous end of the scale. The married women felt that men made fewer distinctions between "male" and "female" intelligence than unmarried women felt they made.

A study on the fear of success and the mature married woman (Verheyden-Hilliard, 1974) based on the Horner study of undergraduates (1969) found that the mature woman projected a positive, unfearful image of success.

Bardwick (1971), Groth (1969), and Gray-Shellberg et al. (1972) all postulate that after having been married and having children, women are more likely to consider themselves free to pursue their own interests. It is at this point that the mature woman, in search of her future, may seek a counseling service in an academic, agency, or business setting.

THE COUNSELORS

It is necessary to recognize and deal with the concept that bias against women is often held by the professional to whom she turns for aid.

Broverman, Vogel, Broverman, Clarkson, and Rosenkrantz (1972) found that the clinical psychologists, social workers, and psychiatrists in their study all considered that "healthy women differ from healthy men [and from healthy adults, sex unspecified] by being more submissive, less independent, less adventurous, less objective, more easily influenced, less aggressive, less competitive, more excitable in minor crises,

more emotional, more conceited about their appearance, and having feelings more easily hurt [p. 70]." If such is the ideal of what a "healthy" woman should be, it would give anyone pause before suggesting that such a person undertake a demanding career. The important thing to remember about the Broverman study is that the clinicians were indicating an opinion not as to the way women are, but as to the way they felt "healthy" women should be. Broverman et al. (1970) suggest that this view conceals "a powerful negative assessment of women [p. 7]."

Neulinger (1968), cited by Broverman et al. (1972), writes that "the sex orientation of this society is not only shared, but also promoted by its clinical personnel" because a woman is seen not as an adult who should function optimally but rather as as "affiliative, nurturant, sensuous playmate who clings to the strong, supporting male [p. 554]."

In a sample of 35 females and 24 males representing five professions—caseworkers, caseworker supervisors, teachers, research psychologists, and consultants—Kaley (1971) found that caseworkers and married professional men expressed negative attitudes toward women who are attempting a dual role with family and professional career. Age, education, race, and professional experience of the participants did *not* correlate with negative attitudes toward the dual role, but sex and profession did. Certainly this bias will affect the aspirations for further education or better job status of women whose lives depend on caseworker approval of their behavior.

The "specter of covert discrimination against the 'liberated woman,' unintentional though it may be," is raised by "nonliberal" counselors who view politically active and left-oriented women as more maladjusted than identically described males (Abramowitz, Abramowitz, Jackson, & Gomes, 1973, p. 391).

Counselors, both male and female, displayed more negative than positive bias toward female counselees expressing an interest in engineering as a career. The bias was expressed not because of concern that women lacked the necessary ability but because engineering was seen to be a "masculine" field (Pietrofesa & Schlossberg, 1970). Women who expressed an interest in engineering were also considered more "deviant" and in need of counseling than young women expressing an interest in home economics, which was seen to be a more appropriate goal by both male and female counselors (Thomas & Stewart, 1971).

Eyde (1970) suggests counselor bias may be based on misconceptions concerning women's willingness to make a commitment to their jobs. Bingham and House (1973) found that counselors, both male and female, deny being aware of well-publicized information concerning the number of women who work and the discrimination they encounter in the business and academic worlds. The authors conclude that this indicates a negative attitude toward women.

The preceding studies of counselor attitudes give us reason to hypothesize that the reentering woman as well as all other women may have a severe problem getting reasonable support for their interests unless those interests indicate a choice that is essentially traditional, conservative, submissive, nurturant, dependent, sensuous, or unaggressive, or some combination thereof. Furthermore, if the counselors are themselves denying or lacking information on the problems facing women in the world of work or academia, they are certainly not in any position to provide the woman with the information or support she will need as she proceeds toward her goals. The need for "increased attention, in clinical and counseling psychology training programs, to the problem of examiner bias [Abramowitz et al., 1973, p. 391]" would seem to be very real indeed.

Ironically, the problem of counselor bias may even be intensified by the development of inventories that are truly free of sex bias. Women using an unbiased inventory may score higher on interests that counselors have heretofore considered "deviant." The most sex-fair inventory imaginable will be useless, if not downright harmful, in the hands of a sex-biased counselor —however unconscious and unmalicious his or her bias may be. Consider being told how deviant and how in need of counseling you are because you want to pursue a particular career. It is the urgent and unassailable responsibility of the test makers and publishers to protect women from further denigration by providing information imbedded in the inventory package

(and therefore more difficult to deny or ignore) that would be supportive of women wishing to move in new directions and enlightening to counselors with misconceptions or biases.

NEW CONCEPTS CONCERNING THE REENTRY WOMAN

AS STUDENT

Concerned about age and appropriateness, mature women may limit their expression of interest or feel themselves unable to pursue an interest if it requires further schooling. Counselors may also hesitate to encourage the mature woman to begin a college program or pick up at graduate school because of age, length of time elapsed since the woman's last educational experience, or concerns over family responsibilities. This may cause the woman to consider and the counselor to advocate the pursuance of lower status occupations than the woman's interests indicate or her abilities warrant. Both the women and the counselors need to know that, contrary to stereotypic notions of the capabilities of students over the traditional age, women who enroll in graduate school after a substantial time-out period from educational pursuits are often more motivated to achieve than younger women or undergraduates and that they are more successful in leaving behind cultural restraints in regard to women's achievement (Lubetkin & Lubetkin, 1971). Typically, the mature woman attending graduate school has two or three children and takes care of her family herself. She is in graduate school because she wishes to achieve and develop a career (Withycombe-Brocato, 1969). Probably the number of married women in school would increase if their class time could be scheduled at the same time as their children's classes (Osborn, 1973).

The factor that militates against the mature woman's pursuing her interests with further education is the discrimination she encounters at every level in her role as student as she seeks admission, financial aid, guidance, and opportunities for assistantships (Randolph, 1965). Financial barriers affect the whole economic spectrum from the middle-class woman who will not divert the family's financial resources from her children's education in order to further her own goal, to the poor woman who has little money for necessities and none at all for advanced education. Older women as well as young women of high ability but low socioeconomic status are the largest group of academically well qualified people who are not attending college (Cross, 1968).

If a woman is trapped at home taking care of children or trapped in a low-paying job, a desire to upgrade her situation is futile unless a way can be found to provide the financial means to undertake the change. The mature woman often requires financial assistance for two reasons: to defray the cost of training and education, and to support and care for her family while she prepares herself for advancement. The question of day care, which affects the choices women from all socioeconomic groups are able to make, cannot be ignored (Steinmann, 1970). For the increasing number of women who are heads of households (U.S. Department of Commerce, 1973) the problems are intensified. Women without sufficient education or training lose the ability to benefit from or even remain in the work force (U.S. Department of Labor, 1970a).

Recognizing that "many of the persons who are most desirous of a latter-day education are women with families to support [Miller, 1973, p. 398]" and that graduate students *without dependents* receive more financial assistance than students with dependents (Hunter, 1967), we can see that counselors need to be aware of the problems of the reentry woman as student. They need to be willing to try to help her solve them if she is to make effective use of interest inventory results. The development of nonstereotypic, superior counseling may be one of the most important factors in the success of the mature woman, whether of the majority or a minority group, as returning student (Lloyd-Jones, 1958; Miller, 1973; Osborn, 1973; Westervelt, 1973). Here is an opportunity for the makers and publishers of interest inventories to provide counselors with information related to the needs of mature women that would help make that kind of counseling possible.

IN THE WORK FORCE

Although the total number of women in the labor force has increased only slightly since 1940, a definite trend is apparent in the rapid increase in the number of mature, married women who are working (Oppenheimer, 1968, 1970). The 320-percent (*sic*) increase in the number of working married women since 1940 is apparently not caused solely by poverty-line incomes. In families where the husband's income is $10,000 or more, a third of the white wives and about half of the black wives were either working or looking for work (Waldman, 1972).

The percentage of married women (husband present) who are in the work force peaks for white women between the ages of 45 and 54 at 46.7 percent. The peak for black women and women of other races, 56.7 percent, occurs between the ages of 35 and 44. The highest total of all married women (husband present) in the work force is 47.3 percent between the ages of 45 and 54. For comparable ages in 1940 the percentages are up 36.6 for white women and 26.2 for black women and women of other races (U.S. Department of Commerce, 1973).

Of the women who work, 7.4 million had children from 6 to 17 years of age; 2.1 million had children 3 to 5 years of age; and 2.1 million had children under 3 years of age. That is, 4.2 million mothers of preschool children are working (U.S. Department of Labor, 1970c).

Women who work average 5.7 sick days a year as against 5.5 sick days a year for men. Women are chronically sick less than men and have fewer acute conditions due to injuries than men (McKiever, 1965). While the sex differences in turnover rates of Federal career employees are negligible, the turnover rate of middle-aged women is lower than that of younger men (Maslow, 1970). Men and women of *similar* job level and with *similar* length of service have absentee records and job turnover rates that differ little from each other (U.S. Department of Labor, 1969).

The women of America can expect to work 25 years if they are married, and 40 years if they are not (Schwartz, 1967). The woman worker of the seventies is older, married, living with her husband, and a high school graduate with some postsecondary school education (U.S. Department of Labor, 1970b).

This profile of the behavior of working women and the impact of the work force on them does not seem to coincide with the usual cluster of stereotypic notions concerning women's work habits—for example, that (1) a woman works only as a stopgap measure until Prince Charming sweeps her off her feet, (2) she returns to the labor force only if obliged to through her husband's desertion by death, divorce, or separation, and (3) when women do go to work they are frequently absent and probably will quit the second week to get married or have a baby.

Being aware of the nonstereotypic demographic facts may help to improve the quality of counseling young women receive in high school and college and certainly should improve the quality of counseling for the prospective reentry woman if, as Eyde (1970) suggests, counselor bias may be caused by misconceptions of women's willingness to make a commitment to a job. The mature woman needs to know and her counselor needs to know that she is not a strange overage nonconformist. Rather she is part of a group—married, mature women—that constitutes the majority of the female labor force in this country.

In terms of interest inventories the need seems clear. The interests and occupations of women are not as peripheral or unimportant in respect to the totality of their lives as counselors, and indeed the women themselves, have been led to believe. What one does for 25 to 40 years of a life ought to warrant careful consideration of interests and abilities in order to provide job satisfaction as well as security.

Although a larger proportion of women are working now than in 1940, that same length of time has seen a 16-percent decrease in the numbers of women in the professional and technical occupations (Chess, 1969). "The undigested challenge for educators is that most women who now join the labor force do so after the age of thirty-five in jobs well below their capability [p. 627]."

AS FAMILY MEMBER

The small representation of women in the professions and in high status positions is a logical consequence of wom-

> en's cultural mandate which prescribes that their primary allegiance be to the family. . . . Once the premise of this mandate is granted, women who have or wish to have careers are said to have a "conflict," and this conflict is seen as a source of disruption of the social order (Coser & Rokoff, 1971, p. 535].

Twenty-five years ago the 1950 White House Conference papers stated that the family had an infinite capacity to change both in its composition and in the way it cares for the children. The papers suggested that it is possible for the family to share the care of children with other social institutions yet retain overall responsibility for them (National Manpower Council, 1958).

The question of child care and the effect of maternal employment on the children continues to loom large in the mind of the prospective reentering woman. Yet Nye and Hoffman (1963) found that working mothers have no more problems with their children than do nonworking mothers and that working mothers show a more positive attitude in their relationship with their children. Findelman (1966) indicates that children did not see parental roles any differently when mothers worked. The Women's Bureau (U.S. Department of Labor, 1973) concludes that whether or not the mother works is not the determining factor in juvenile delinquency.

Kaley (1971) found that married professional women had a positive attitude toward their dual role, whereas Orden and Bradburn (1969) indicated that a woman's perception of her marriage was one of strain when she worked but that the children of the marriage were not under strain.

The strain of the double burden of career and home responsibilities may be somewhat less for women with husbands present. Working mothers do fewer of the household tasks and their husbands do more than in the traditional marriage. The greatest difference to be found between men who helped with household tasks and those who did not was based *not* on race or social class but on whether or not their wives worked (Blood & Wolfe, 1960; Gillette, 1961).

Feelings about money earned by the married woman vary from study to study. Orden et al. (1969) found that both partners were less happy if the wife worked to support the family than if she worked simply because she wanted to. Nye et al. (1963) found that tension is reduced in the family if the husband does not have to shoulder the whole provider role alone but rather can share it with his wife.

As society in the seventies expands its consideration of alternative lifestyles that allow for greater participation of the man in the life of his family and allows the woman greater participation in the life of the world, the reentry of women will be smoother and less abrupt. Presently, however, because of the cultural mandate of her family role, a woman has a pattern of educational and work development different from that of a man. She also carries a burden of concerns centering on the socialization demand that she always consider the needs of children and husband first. These concerns will effectively limit her choices unless she is helped to see alternatives.

Some men pursue their own needs and careers regardless of the effect on their wives and children. But being considerate of and caring deeply for wife and children while still engaging in the development of a career is possible for many men and, indeed, is probably the ideal toward which boys are socialized. Girls are socialized to be considerate and to care deeply, but the parallel independent development is not the ideal; socialization for girls says they must choose. Effective counseling would present the parallel as a way for women as well as men to live, and an effective users handbook and counselors manual might contain material to help the woman pursue parallel independent development.

AS ACHIEVER

McGowan and Liu (1970) studied 168 middle-aged women who were attempting to develop various commitments beyond the parameters of their family. The group profile of these women showed them to be highly intelligent, adventuresome, assertive, very creative, relaxed, reserved, and affected by feelings. They were within a psychologically healthy range and creatively productive.

We should not assume that the middle-aged women who pursue commitments outside their

family are all middle class and educated, whether of majority or minority groups. Among them are those women, black or poor or both, who have often been the movers and doers of inner-city life as community workers and political activists. These women, as well as their more affluent sisters, black and white, are also in need of nonstereotypic counseling.

> These [black and/or poor] older women students are coming into the undergraduate student body of this country in ever increasing numbers and they will have to be reckoned with [Miller, 1973, p. 398].

Clearly, stereotypes of mature women as dilettantes or neurotics when they attempt to begin a second career outside their homes must give way to new concepts, for the reentering woman appears to possess a cluster of personality traits that have much in common with what other studies have shown to be the personality traits of achieving women.

Bachtold (1972) studied women listed in *Who's Who in America* and *Who's Who of American Women* as biologists, microbiologists, chemists, and biochemists, ranging in age from 46 to 60. She found these women, as a group, to be more serious, confident, dominant, radical, intelligent, and adventuresome and less social, group dependent, and sensitive than women in the general population. Bachtold also found, as did Diamond (1971), that men and women as professionals in the upper occupational levels showed strong similarity in their personality scores.

The characteristics of women holding executive, managerial, and other high-level positions in business were found by Bryce (1969) to include self-assurance, decisiveness, the ability to supervise others, and above-average intelligence. Stevens (1973) concluded that high job placement readiness coincided with dominance, tough-mindedness, and low neuroticism. Of the 101 females and 50 males in the Stevens study, those who were tough-minded, independent, and nonneurotic had specific job goals and self-actualized behavior. They were also highly successful in getting jobs.

Although Bachtold and Bryce studied women in nontraditional careers, there was no indication of psychological "deviance" because of the choice of occupation. As Almquist and Angrist (1970) noted, atypical careers do not reflect deviant experiences associated with personality maladjustment but rather reflect experiences that have broadened and enriched women's options.

Counselors interpreting interest inventories need to be aware of the implications of the preceding studies and others like them. As Helson (1972) points out, studies of career interest in women "which show career orientation in a favorable light [have] received very little attention [p. 39]." As the inventories become more sex-fair, thereby allowing a broader range of options to women, it becomes even more urgent that the woman who demonstrates assertiveness, adventuresomeness, creativity, and high intelligence combined with possibly atypical interests not be counseled about the "deviance," "unfemininity," and "inappropriateness" of her behavior.

THE SECOND CAREER

The mature woman is constantly faced at the reentry door with the question that is in her own mind and in the minds of those she is approaching: Is it too late? From some quarters she gets an expected, stereotypic answer: Yes, it is. In other quarters the concept of a second career, now quite familiar in the male world, is being extended to the reentering woman. Business, industry, and government do not think it unusual to train and retrain the men whom they wish to work for them. As William H. Miller, marketing vice president of American Oil Company, suggests (Bird, 1971), there is no reason to discriminate against women in this area either:

> So some women do take time out from the jobs to have children. Some men leave one company to go to another or to start a business of their own; some men crack up on a job and must be replaced; some men become seriously ill or die before they reach the normal age of retirement. Some become alcoholic. Management doesn't refuse to hire or promote them just because these things happen [p. 44].

Like Sojourner Truth (1972), who wearied of seeing the prejudices against women passed off as concern for their womanly "delicacy" by those who ignored the kind of work she herself had been doing although she certainly was a

woman, I would ask this question: If it is not too late for the reentering woman to spend the remaining years of her life standing behind a file cabinet, or scrubbing the floors in an office building, or standing behind a dime-store counter, or sitting behind a typewriter, why is it so terrible and "too late" for her to spend a percentage of that time educating or training herself and then being hired to spend her remaining years in rewarding work that is commensurate with her abilities? Must we believe that society wants and needs to keep her in her "place" so that the menial jobs of the world will have a ready labor supply?

The reentry woman needs the most sex-fair inventory imaginable along with the help of a perceptive, sensitive counselor. And then, given even that, we still need to remember that "it will be extraordinary if her intelligence and application bring equal rewards from a society that has promised her nothing less than equality [Epstein, 1971, p. 17]."

THE INTEREST INVENTORY

Other papers in this volume deal in depth with the problems of sex bias in career interest inventories related to technical issues of scale development and criterion and norm group composition, test orientation and interpretation, item content, legal issues, impact of inventories on career choice, and the interrelation of social class, race, and sex bias. The reader is referred to all of these papers for broad and basic considerations of these specific issues that affect the reentering woman. This paper will examine selected material from the various inventories as examples that are seen to affect the usefulness of an interest inventory for the reentering woman.

LANGUAGE

Six inventories—the American College Testing Program (ACT) Interest Inventory, the Kuder DD Occupational Interest Survey (OIS), the Minnesota Vocational Interest Inventory (MVII), the Ohio Vocational Interest Survey (OVIS), the Self-Directed Search (SDS), and the Strong-Campbell Interest Inventory (SCII)—were surveyed. Four of these—Kuder OIS (except for the new *Interpretive Leaflet*), MVII, OVIS, and SDS—appear to show the effects of Strainchamps' (1971) contention that English is the most masculine language in the world. In the above four inventories (with the noted exception) all pronouns used to refer to test takers or test administrators are masculine. There are no "shes" taking or administering these inventories, if language is any indication.

The ACT Interest Inventory, the new SCII, and the Kuder OIS *Interpretive Leaflet* are free of single-sex references (so far as could be determined). ACT and the SCII have demonstrated that there is no longer any question whether it is possible to write such an inventory. The only question is whether it will be done. Paraphrasing Diamond's (1972) discussion of the masculinity-femininity scales, I would suggest that the generic use of the masculine gender is also a concept whose time has passed and the use of *he* to denote all persons of unspecified gender who are giving or taking an inventory is no longer acceptable for any reason.

Some uses of language are not expressly masculine but have a masculine or social-class flavor. Under Part VII of the SCII, the person is asked to write yes or no after "Stimulate the ambitions of my associates." *Associates* has a masculine, professional flavor and is probably related to social class as well. Except possibly women professionals—a very small group indeed—women generally, and lower socioeconomic groups of women in particular, refer to those around them not as their associates but rather as friends or acquaintances. Changing "associates" to "friends and associates" might make it more likely that women would respond positively if the activity appealed to them.

OCCUPATIONAL TITLES

The Bureau of the Census occupational classification system has revised its occupational titles in order to identify and modify those titles which imply sex stereotypes (*Statistical Reporter*, 1973). Fifty-two of the job categories have

been modified. Titles in some of the interest inventories need to be reviewed for the same purpose.

It may not be sufficient, however, to change *mailman* to *mail carrier* or *salesman* to *salesperson* or *housemaid* to *housecleaner*. Many titles such as *electrician, typist, surgeon,* or *nurse,* though carrying no visible sex identification, require almost brain-wrenching effort if one is to picture the nontraditional sex in the role. One way to help people, whether male or female, to extend their options would be through additions to instructional and interpretive material that suggest laying aside preconceived ideas of "appropriate" interests for men or women. This "sanction" to express an interest whatever it may be is really no different from the sanction already included in many inventories to express an interest even though the taker has not had the prerequisite training and may not know whether s/he has the necessary ability to develop the interest.

ITEMS

In the SCII under Part IV, Amusements, one of the choices is "church young people's group." Traditionally, minority and majority women of all ethnic backgrounds and all socioeconomic groups and religious persuasions have often pursued a social life in conjunction with a religious institution. Removal of the words *young people's* and substitution of phraseology such as "religion-related social group" would allow adult women to respond positively if they so desired and would eliminate age bias in this item. (Another point, perhaps outside the focus of this paper, is that in every inventory where the word *church* is used, another word should be found that would recognize the diversity of the American religious experience and thereby eliminate the present religious bias in the inventories.)

INSTRUCTIONS

In the SDS test booklet (p. 4) the user is instructed to "blacken under 'D' for those things you are indifferent to, have never done, or do not like." The taker, who may have a lengthy list of things she has never done, is prevented from indicating an interest in exploring new areas. It is quite possible that she has never taken a woodworking course, an auto mechanics course, or a chemistry course and she is therefore required to write that she "dislikes" these activities. Although under "occupations" (p. 8) she is allowed to indicate that the occupation of chemist interests her, the fact that under "activities" she is forbidden to say she would like to take a chemistry course will affect her final summary score, making it lower in chemistry than it might be.

The assumption appears to be that one can't be that serious about occupations one has not already experienced in some manner. That assumption is particularly discriminatory of women with limited educational backgrounds or traditional backgrounds and allows them little opportunity to expand options. The socialization of women to avoid certain areas plus the fact that they have been summarily barred in most high schools from taking shop or mechanics courses is not taken into consideration. Neither is the fact that schools from which mature women graduated a number of years ago may not have offered a selection of science courses from which to choose. But most importantly the restriction ignores the fact that many mature women may now be ready to consider areas they formerly deemed closed to them.

If the SDS is to be a diagram of where a person has been, that is one thing. If it proposes to suggest how a person may move in expanded directions, that is another. And a person should not taken an inventory expecting the latter when s/he is in reality getting the former.

SINGLE-SEX INVENTORY

The manual of the MVII states clearly what is aims to do: "provide systematic information on the interest patterns of men in nonprofessional occupations" and aid the counselor in working with the "large majority of persons planning to enter skilled, semiskilled, and unskilled occupations . . . [p. 7]."

Government statistics showing that 34.1 percent of all women working are in skilled or unskilled positions (U.S. Department of Commerce, 1973) are an indication that the MVII could usefully prepare an inventory for both men and women to aid counselors working with women in the same category. In a description of the inventory on page 8 of the manual the complete list of items used as examples is as follows:

x a. Tune a piano
b. Cook a meal
c. Change a tire on an automobile

y a. Varnish a floor
b. Learn to use a slide rule
c. Repair a broken connection on an electric iron

z a. Putter around in a garden
b. Take part in an amateur contest
c. Cook spaghetti

This is not a list of activities impossibly foreign to women's considerations.

In the manual of the MVII the homogeneous scales are derived by "identifying clusters of items that are related to each other." This could provide a base for women, as well as men, to look at related fields in a way that might expand their job choice. This would be similar to Cole's (1972) suggestion of cross-matching related structures of men's and women's interests. To the woman with less education who cannot, at the time, go on to further academic training, this inventory exploring health and food services, office work and mechanical, electronic, and sales fields, as well as opportunities in the outdoors, would offer expanded options.

The U.S. Navy, for which the MVII was originally prepared, is now opening its door to women at all levels. It would seem an appropriate time for the MVII to do the same.

AGE OF USER

Although some of the inventories declare themselves to be for use with high school or college students, that would not, on the surface, eliminate their use with the reentering woman. She may be educationally at the high school or college level. Most items seem acceptable for all ages, although response rates might differ. Whether or not the technical aspects of an inventory expressly directed toward a young group would be suitable for the reentering woman will be discussed in the paper on technical aspects.

RECOMMENDATIONS

FOR COUNSELOR EDUCATION

The question of counselor bias has been raised more than once (Abramowitz et al., 1973; Bingham et al., 1973; Broverman et al., 1970, 1972; Dewey, 1974; Eyde, 1970; Neulinger, 1968; Pietrofesa et al., 1970; Thomas et al., 1971; Weisstein, 1970). All these studies, and possibly others, have touched on some aspect of the bias women are likely to encounter in guidance situations.

The question of sex bias clearly needs to be taken up in a meaningful way in the training programs of all those involved in guidance for women.

Ways must also be found to reach the practicing counselor through in-service training as well as the counselor educator, whose personal attitudes and interpretations as well as selection of materials for classroom use are likely to have considerable influence on the new counselor.

One way of insuring that material on sex bias reaches all counselors is through certification requirements such as the multiethnic courses required in some states. While no one supposes that lifelong attitudes can be changed in a semester, a requirement of at least one course on the special needs of women could provide counselors with some much-needed insight.

The need for counselors and personnel workers to be specially trained to deal with the special concerns and motivations of the mature woman has been recognized for many years (Letchworth, 1970; Myers, 1964; National Manpower Council, 1958; Ruslink, 1969; U.S. Department of Labor, 1966). Clearly, a semester could be more than filled with information needed by any counselor who is going to be dealing with girls, young women, or reentry women.

FOR RESEARCH

On women. Whether mother worked, whether she stayed home, whether she earned too much money, whether she ignored or s'mothered her children—whether she did whatever she did has almost always been researched as to the effect of her activity on some *other*. Research is needed on the woman herself. What are women like who successfully carry out a dual role? How did they get that way? What has negative effects on her? What works for her? What can we learn about her that will help other women? Are there models and guidelines for the successful development of parallel growth of family and career life for women that can be filtered out and made available for other women's consideration—and for the information of counselors? Perhaps more than descriptive research, we need to know the hows and whys of the different lifestyles and roles of women.

Research on women—as differentiated from the effects of their activities on others—has been a very scarce commodity and in no way reflective of the fact that women represent more than half of the population, all of the wives and mothers, and more than 40 percent of the country's work force.

On undergraduate and graduate guidance teaching materials. Many groups are presently engaged in the study of sex-biased curriculum materials used in grades K through 12. Curriculum materials used to teach counselors have not been as carefully surveyed. What are those books saying in regard to "femininity," "appropriate" female behavior, and projected adult roles? Counselors dealing with women giving new responses to new kinds of tests are going to need some new answers.

On Continuing Education for Women programs. Older CEW programs such as those at Sarah Lawrence College, George Washington University, and the University of Minnesota, to mention but three of the better known, have been and are being followed by a burgeoning of CEW programs across the country. Who are the women these programs serve and what are their needs? What additional services must be provided in order to reach an even larger segment of the potential reentry population? As more and more women return to school, the CEW programs become a crucial reentry point; standards, attitudes, and programs that have most effectively facilitated the reentry woman's pursuance of her goal need to be recorded and disseminated. Research is needed on effective CEW programs in order to develop models and guidelines.

FOR THE INTEREST INVENTORY

The makers and publishers of interest inventories cannot be expected to change the world by themselves, nor are they responsible for biases and misconceptions the test takers and the test administrators bring with them. But the interest inventory could be enriched with information providing a new view of the mature woman which would help the counselor and the woman deal with their own problems of bias and self-concept. For the instrument to have any deep usefulness, simple sex fairness in the matter of language, items, and other factors, followed by benign neglect of the crucial effect of socialization, will not do the job. Affirmative action in the way of instructional and interpretive material plus followup information is what is needed.

Instructions. Being a member of an extremely diverse group ranging widely in age, skills, and educational level may not be the primary problem for the reentering woman as she takes an inventory. Quoting Craven (1961), Kuder (1971) writes: "Expressed interests . . . represent conscious efforts to integrate pressures and needs, hopes and aspirations [p. 2]." Kuder then goes on to say, "These efforts might result in a false picture of the individual's interest . . . [p. 2]." In like manner, the problem of the reentering woman may be that her socialization has been so intense that the inventory may still be picking up only expressed interests rather than measured interests.

In order to help women feel free to express their own unencumbered interests, it may be

necessary to have printed and verbal instructions that encourage them to think in a nonsocialized framework, such as the following:

1. Pretend you have no responsibilities, no marriage, no children.
2. Express your interests regardless of any conflict you feel they might cause with other considerations in your life.
3. Do not let your present age, measured against the amount of training you may think a certain interest requires for implementation, limit your expression of interest.
4. Do not let minority or ethnic group membership, measured against the amount of bias you perceive in society, limit your expression of interest.
5. Put aside concepts of what is "appropriate" work for a woman (or man).

Even before the instructional stage has been reached, the counselor should have orientation materials suitable for preliminary discussion of sex roles, home-career conflict, and the "appropriateness" issue.

The provision of a "sympathetic set [Farmer & Bohn, 1970, p. 230]" in the orientation and instructional materials may be a major factor in attaining the goal of a dependable measure of interests.

Interpretive materials: counselors manual. In order to offset counselor bias or misconceptions, the manual should provide a discussion of the "new" concept of the mature woman in terms of her ability, her commitment, and statistical information on her role in the work force and the educational world. Information should be provided on the effects of socialization in regard to home-career conflict, "appropriate" work, and the woman's probable need for support in order to break through traditional role concepts. The manual should also refer to Federal laws concerning race and sex discrimination in employment and education such as Title IX of the Education Amendments of 1972, Titles VI and VII of the Civil Rights Act of 1964, Executive Order No. 11246, Titles VII and VIII of the Public Health Service Act, and the Equal Pay Act of 1963. A careful counselor can at least make a client aware of the support Federal laws can give her if she should feel she has encountered discrimination in her efforts to move forward with her education or her career.

Interpretive materials: users handbook. In order to insure that the client is not totally dependent on the counselor for the information she needs, a users handbook should be provided. Like the counselors manual, it should contain a discussion of the "new" concept of the mature woman, information on the effects of socialization, and reference to guidelines for Titles VII and IX of the Education Amendments of 1972 and for the EEOC, to inform the client about her rights as she proceeds.

These enriched interpretive materials would obviously go beyond simple reporting of test scores and would help the woman to act affirmatively on the results she has received.

> The next stage, as those concerned with women's employment are fully aware, is to find new openings and to raise the general level of women's work. This requires a change of attitude on the part of employers, of the general public, and not least of many of the girls and women themselves. Emphasis is placed both on the need to persuade women to take more full advantage of the opportunities which already exist, and on the need to pioneer opportunities [Seear, 1971, p. 107].

An enriched interest inventory could be a factor in helping women accomplish the "next stage."

CONCLUSIONS

The makers and publishers of interest inventories surely do not see themselves as hucksters (a very unlikely idea, one would suppose) who simply sell their patent medicine product to the drugstore, giving hardly a thought to the effect of the use of that product on the individual who comes to the drugstore looking for help. That being the case, they will perhaps see that there is a need, which they can responsibly fill, for an enriched inventory to help the individual get the most benefit from taking an interest inventory.

Counselors and personnel directors also must make a decision. Are they simply going to be "in the middle," passing along test products to their customers in the manner of drugstore clerks handing patent medicine over the counter? Or do they feel they have a deeper interpretive and supportive role to play in understanding what the instrument means and can mean to each individual? The test administrators are not yet in the position of the physician who allegedly cannot keep up with the new medicines. There are not so many inventories that a counselor could not read and screen them all carefully. If counselors do little but sit in the middle, then the test can nearly be equated with a placebo, and whether or not it helps will be almost totally dependent on the mind-set of the client; neither the counselor nor the test will have had the maximum effect of expanding options.

Surely counselors want to be more than drug clerks and surely interest inventories should be more than placebos. Counselors must take on this responsibility and the test makers and publishers must help them in their undertaking or, as Goldman (1972) has suggested, pigeonholing rather than developing potential will continue to be the outcome of testing. In which case, as he also suggested, perhaps another way of assessment should be found.

SUMMARY OF RECOMMENDED GUIDELINES

1. Eliminate generic language.
2. Eliminate sex labels for jobs such as "craftsman" and "repairman."
3. Eliminate age references such as "young people" and "young woman" when they serve no test-related purpose.
4. In the same way the test taker is enjoined not to let lack of ability or training hinder an expression of interest, the orientation and instructional material should enjoin the taker to put aside concerns about home-career conflict, "appropriateness" of kinds of work for women (or men), and considerations of age.
5. Develop a counselors manual that would include discussion of women's need for support in breaking through traditional roles; new concepts of the mature woman; new concepts of "appropriate" work for women; statistical information on the mature woman's work habits and ability as employee and student; Federal law regarding race and sex discrimination in education and employment; and possible counselor bias.
6. Develop a respondents handbook that the client can take with her, thereby making her less dependent on the counselor. It should include discussion, from the respondent's point of view, of the various topics suggested for the counselors manual in 5 above. It should also include a discussion of generalized "next steps" in how to proceed in entering the business or academic world.

REFERENCES*

Abramowitz, S. I., Abramowitz, C. V., Jackson, C., & Gomes, B. The politics of clinical judgment: What nonliberal examiners infer about women who do not stifle themselves. *Journal of Consulting and Clinical Psychology*, 1973, 41, 385-391.

Almquist, E. M., & Angrist, S. S. Career salience and atypicality of occupational choice among college women. *Journal of Marriage and the Family*, 1970, 32, 242-249.

American College Testing Interest Inventory. Iowa City: American College Testing Program, 1973.

Axelson, L. J. The working wife: Differences in perception among Negro and white males. *Journal of Marriage and the Family*, 1970, 32, 457-464.

Bachtold, L. J. Personality characteristics of women scientists. *Psychological Reports*, 1972, 31, 391-396.

Bardwick, J. M. *Psychology of women*. New York: Harper & Row, 1971.

Bingham, W. C., & House, E. W. Counselors view women and work: Accuracy of information. *Vocational Guidance Quarterly*, 1973, 21, 262-268.

Bird, C. The sex map of the work world. In M. H. Hoffnung Garskof (Ed.), *Roles women play: Readings toward women's liberation*. Belmont, Calif.: Wadsworth, 1971.

Blood, R. O., & Wolfe, D. M. *Husbands and wives: The dynamics of married living*. New York: Free Press, 1960.

Broverman, I. K., Broverman, D. M., Clarkson, F. E., Rosenkrantz, P. S., & Vogel, S. R. Sex role stereotypes and clinical judgments of mental health. *Journal of Consulting and Clinical Psychology*, 1970, 34, 1-7.

Broverman, I. K., Vogel, S. R., Broverman, D. M., Clarkson, F. E., & Rosenkrantz, P. S. Sex-role stereotypes: A current appraisal. *Journal of Social Issues*, 1972, 28, 59-78.

Bryce, R. A. Characteristics of women holding executive, managerial, and other high level positions in four areas of business. Doctoral dissertation, Colorado State College, 1969.

Chess, E. L. A modest proposal for the education of women. *American Scholar*, 1969, 38, 618-627.

Cole, N. S. On measuring the vocational interests of women. (American College Testing Research Report No. 49) Iowa City: American College Testing Program, 1972. (ERIC Abstract, 1972, ED 060 821)

Coser, R., & Rokoff, G. Women in the occupational world: Social disruption and conflict. *Social Problems*, 1971, 18, 535-554.

Craven, E. C. *The use of interest inventories in counseling*. Chicago: Science Research Associates, 1961.

Cross, K. P. College women: A research description. *Journal of the National Association of Women Deans and Counselors*, 1968, 32, 12-21.

Dewey, C. R. Exploring interests: A non-sexist method. *Personnel and Guidance Journal*, 1974, 52, 311-315.

Diamond, E. E. Occupational interests: Male-female or high-level/low-level dichotomy? *Journal of Vocational Behavior*, 1971, 1, 305-315.

Diamond, E. E. The masculinity-femininity scale in interest measurement: An idea whose time has passed. Paper presented at annual convention of American Psychological Association, Honolulu, 1972.

Dolan, E. F. Women's continuing education: Some national resources. *Journal of the National Association of Women Deans and Counselors*, 1965, 29, 34-58.

Entwisle, D. R., & Greenberger, E. A survey of cognitive styles in Maryland ninth graders: 4 views of women's roles. (Johns Hopkins University Center for the Study of Social Organization of Schools, Report No. 89) Baltimore: Johns Hopkins University Press, 1970.

Epstein, C. F. *Woman's place*. Berkeley: University of California Press, 1971.

Epstein, C. F. Structuring success for women: Guidelines for gatekeepers. *Journal of the National Association of Women Deans and Counselors*, 1973, 37, 34-42.

Eyde, L. D. Eliminating barriers to career development of women. *Personnel and Guidance Journal*, 1970, 49, 24-29.

Farmer, H. S., & Bohn, M. J. Home-career conflict reduction and the level of career interest in women. *Journal of Counseling Psychology*, 1970, 17, 228-232.

Findelman, J. J. Maternal employment, family relationships, and parental role perception. Doctoral dissertation, Yeshiva University, 1966.

Gillette, T. L. The working mother: A study of the relationship between maternal employment and family structure as influenced by class and race. Doctoral dissertation, University of North Carolina, 1961.

Goldman, L. Tests and counseling: The marriage that failed. *Measurement and Evaluation in Guidance*, 1972, 4, 213-220.

Gray-Shellberg, L., Villareal, S., & Stone, S. Resolution of career conflicts: The double standard in action. Paper presented at annual convention of American Psychological Association, Honolulu, 1972.

Groth, N. J. Vocational development for gifted girls. Paper presented to American Personnel and Guidance Association, 1969.

Hawley, P. What women think men think: Does it affect their career choice? *Journal of Counseling Psychology*, 18, 1971, 193-199.

Helson, R. The changing image of the career woman. *Journal of Social Issues*, 1972, 28, 33-46.

Hoffman, L. W. Childhood experiences and achievement. *Journal of Social Issues*, 1972, 28, 129-155.

Holland, J. L. *Professional Manual for the Self-Directed Search*. Palo Alto, Calif.: Consulting Psychologists Press, 1972.

Horner, M. Fail: Bright women. *Psychology Today*, 1969, 3(6), 36-41.

Hunter, J. S. The academic and financial status of graduate students, spring 1965. Washington: U.S. Office of Education, 1967.

Iscoe, I., Williams, M., & Harvey, J. Age, intelligence and sex as variables in the conformity behavior of Negro and white children. *Child Development*, 1964, 35, 451-460.

Kaley, M. M. Attitudes toward the dual role of the married professional woman. *American Psychologist*, 1971, 26, 301-306.

Kichter, J. H. Marriage and motherhood of black women graduates. In N. Glazer-Malbin & H. Waehrer (Eds.), *Woman in a man-made world*. Chicago: Rand McNally, 1972.

Komarovsky, M. *Women in the modern world—their education and their dilemmas*. Boston: Little, Brown, 1953.

Kuder, G. F. Kuder DD Occupational Interest Survey. Chicago: Science Research Associates, 1971.

Leland, C. Women-men-work: Women's career aspirations as affected by the male environment. Doctoral dissertation, Stanford University, 1966.

Letchworth, G. E. Women who return to college: An identity-integrity approach. *Journal of College Student Personnel*, 1970, 11, 103-106.

Lewis, E. C. *Developing women's potential*. Ames: Iowa State University Press, 1968.

Lloyd-Jones, E. Education for reentry into the labor force. In *Proceedings of the Conference on Woman Power*, New York: Columbia University Press, 1958.

Lubetkin, B. S., & Lubetkin, A. I. Achievement motivation in a competitive situation: The older female graduate student. *Journal of Clinical Psychology*, 1971, 27, 269-271.

Lyon, E. R. Career interest of married women with college degrees. Doctoral dissertation, Northwestern University, 1967.

Maslow, A. P. Job factors, attitudes and preferences affecting the relative advancement and turnover of men and women in Federal careers. Paper presented at annual convention of American Psychological Association, Miami, 1970.

McGowan G., & Liu, P. Creativity and mental health of self-renewing women. *Measurement and Evaluation in Guidance*, 1970, 3, 138-147.

McKiever, M. F. The health of women who work. (U.S. Department of Health, Education, and Welfare, Public Health Service publication No. 1314) Washington: Government Printing Office, 1965.

Miller, B. J. Inner city women in white schools. *Journal of Negro Education*, 1973, 42, 392-412.

Minnesota Vocational Interest Inventory. New York: Psychological Corporation, 1965.

Myers, C. A. Special problems encountered by mature women undergraduates. *Journal of the National Association of Women Deans and Counselors.* 1964, 24, 137-139.

National Manpower Council. Work in the lives of married women. In *Proceedings of the Conference on Woman Power.* New York: Columbia University Press, 1958.

Neulinger, J. Perceptions of the optimally integrated person: A redefinition of mental health. *Proceedings of the 76th annual convention of the American Psychological Association,* 1968, 553-554. Cited in Broverman et al., Sex-role stereotypes: A current appraisal. *Journal of Social Issues,* 1972, 28, 71.

Norton, E. H. For Sadie and Maude. In Robin Morgan (Ed.), *Sisterhood is powerful.* New York: Vintage Books, 1970.

Nye, J. F., & Hoffman, L. W. *The employed mother in America.* Chicago: Rand McNally, 1963.

Ohio Vocational Interest Survey. New York: Harcourt Brace Jovanovich, 1970.

Oppenheimer, V. The sex-labeling of jobs. *Industrial Relations,* 1968, 7, 219-234.

Oppenheimer, V. *The female labor force in the United States: Demographic and economic factors governing its growth and changing composition.* (University of California Population Monograph Series, No. 5) Berkeley: Institute of International Studies, 1970.

Orden, S., & Bradburn, N. Working wives and marriage happiness. *American Journal of Sociology,* 1969, 74, 391-407.

Osborn, R. Characteristics, motivation and problems of mature married women college students: A study of selected students at The George Washington University. In R. Osborn (Ed.), *Developing New Horizons for Women workbook.* (Continuing Education for Women) Washington: George Washington University, 1973.

Pietrofesa, J. J., & Schlossberg, N. K. Counselor bias and the female occupational role. Detroit: College of Education, Wayne State University, 1970. (ERIC Abstract CH 006 056)

Randolph, K. S. The mature woman in doctoral programs. Doctoral dissertation, Indiana University, 1965.

Ruslink, D. H. Married women's resumption of education in preparation for teaching. Doctoral dissertation, New York University, 1969.

Schwartz, J. Planning ahead. In *A woman's work,* pp. 38-39. New York: Barnard College, 1967.

Sear, B. N. *Re-entry of women to the labour market after an interruption in employment.* Paris: Organization for Economic Co-operation and Development, 1971.

Seifer, N. *Absent from the majority: Working class women in America.* New York: National Project on Ethnic America, 1973.

Spokeswomen, 1973, 4(6), 1-12.

Statistical Reporter (Office of Management and Budget), 1973, 74(4). Washington: Government Printing Office.

Steinmann, A. Female role perception as a factor in counseling. *Journal of the National Association of Women Deans and Counselors,* Fall 1970, 27-32.

Steinmann, A., & Fox, D. J. Attitudes toward women's family role among black and white undergraduates. *Family Coordinator,* October 1970, 363-368.

Stevens, N. D. Job seeking behavior: A segment of vocational development. *Journal of Vocational Behavior,* 1973, 3, 209-219.

Strainchamps, E. Our sexist language. In V. Gornick & B. K. Moran (Eds.), *Woman in a sexist society.* New York: Basic Books, 1971.

Strong-Campbell Interest Inventory. (Experimental Edition) Stanford, Calif.: Stanford University Press, 1972.

Thomas, A. H., & Stewart, N. R. Counselor response to female clients with deviate and conforming career goals. *Journal of Counseling Psychology,* 1971, 18, 352-357.

Truth, S. Ain't I a woman? In M. Schneir (Ed.), *Feminism: The essential writings.* New York: Vintage Books, 1972.

U.S. Department of Commerce, Bureau of the Census. *We the American women.* Washington: Government Printing Office, 1973.

U.S. Department of Labor, Manpower Administration, Bureau of Employment Security. *Counseling girls and women: Awareness, analysis, action.* Washington: Government Printing Office, 1966.

U.S. Department of Labor, Women's Bureau. *Facts about women's absenteeism and labor turnover.* Washington: Government Printing Office, 1969.

U.S. Department of Labor, Wage and Labor Standards Administration, Women's Bureau. *Automation and women workers.* Washington: Government Printing Office, 1970. (a)

U.S. Department of Labor, Wage and Labor Standards Administration, Women's Bureau. *Profile of the woman worker: 50 years of progress.* Washington: Government Printing Office, 1970. (b)

U.S. Department of Labor, Wage and Labor Standards Administration, Women's Bureau. *Who are the working mothers?* (Leaflet 37) Washington: Government Printing Office, 1970. (c)

U.S. Department of Labor, Employment Standards Administration, Women's Bureau. *The myth and the reality.* Washington: Government Printing Office, 1973.

Verheyden-Hilliard, M. E. A feminist viewpoint on education and mental health. In F. Christopolos (Ed.), *New perspectives on emotional disturbance: anthropological, feminist and educational.* Laurel, Md.: Edgemeade Centers, 1973.

Verheyden-Hilliard, M. E. The mature married woman and the fear of success: A study of sixty-nine women enrolled in developing New Horizons for Women and Career Development for Employed Women at The George Washington University, Washington, D.C., 1974. (Unpublished manuscript)

Waldman, E. Changes in the labor force activity of women. In N. Glazer-Malbin & H. Waehrer (Eds.), *Woman in a man-made world.* Chicago: Rand McNally, 1972.

Weisstein, N. *Kinder, Küche, Kirche* as scientific law: Psychology constructs the female. In R. Morgan (Ed.), *Sisterhood is powerful.* New York: Vintage Books, 1970.

Westervelt, E. M. A tide in the affairs of women: The psychologic impact of feminism on educated women. *Counseling Psychologist.* 1973, 4, 3-26.

Withycombe-Brocato, C. J. The mature graduate student: Who is she? Doctoral dissertation, United States International University, 1969.

---

*I am indebted to the following compilations and abstracts for the leads provided to relevant material:

Astin, H. S., Suniewick, N., & Dweck, S. (Eds.), *Women: Bibliography on their education and careers*. Washington: Human Service Press, 1971.

Tittle, C. K. *Women and educational testing: A selective review of the research literature and testing practices*. Ford Foundation, Division of Education and Research (Grant No. 720-0430).

Westervelt, E. M., & Fixer, D. A., with the assistance of M. Comstock. *Women's higher and continuing education: An annotated bibliography with selected references on related aspects of women's lives*. Princeton, N.J.: College Entrance Examination Board, 1971.

Women and psychology: Annotated bibliography. Cambridge, Mass.: Cambridge-Goddard Graduate School for Social Change, 1972.

Women Studies Abstracts (P.O. Box 1, Rush, N.Y. 14543).

Costs of Developing Interest Inventories and Implications for Change

/9

Jo-Ida C. Hansen

CENTER FOR INTEREST MEASUREMENT RESEARCH
UNIVERSITY OF MINNESOTA

ABSTRACT

In the preface to *The Vocational Interests of Men and Women* in 1943, E. K. Strong, Jr., acknowledged two major financial contributions that subsidized his investigation of vocational interests and development of the Strong Vocational Interest Blank (SVIB): $18,000 from the Carnegie Corporation in 1935 and $27,400 in grants from the Council of Research in the Social Sciences spread over a period of years.

Thirty years later, the development of a new interest inventory has a projected budget of $340,000 and an anticipated time schedule of 3 years; interest inventory revisions, which once required as long as 13 years, now are completed in 3 compact, intense years.

Interest inventory revisions are as costly as development of new instruments. For either project, funding must include a

yearly $75,000 to $80,000 allowance for personnel. Construction of one empirical scale costs about $2,000 and requires at least 4 months' time. Complete revision of an interest inventory such as the SVIB, which represents 45 years of data collection and empirical research, costs a minimum of $270,000. The publishing expenses above developmental costs are $115,000, bringing the expended funds to $385,000.

If there is to be an increase in interest inventory research, development, and revision, financial support for researchers must increase. Without outside financial assistance, much interest inventory research may halt and needed revision of interest inventories may be impossible to accomplish.

INTRODUCTION

In the preface to *The Vocational Interests of Men and Women* (1943) E. K. Strong, Jr., acknowledged two major financial contributions that subsidized his investigation of vocational interests and the development of the Strong Vocational Interest Blank (SVIB): $18,000 received from the Carnegie Corporation in 1935 and $27,400 in grants from the Council of Research in the Social Sciences spread over a period of years.

Thirty years later, the development of a new interest inventory has a projected budget of $340,000 and an anticipated time schedule of 3 years; interest inventory revisions, which once dragged on for as long as 13 years, now are completed in 3 compact, intense years.

Authors and publishers, previously motivated internally to update and better their tests, are urged to revise by psychologists, educators, lawyers, and students, who express interest in the psychometric quality, the legality, and the usefulness of interest inventories for career education, for vocational decisionmaking, and for generating occupational opportunities.

No longer may the vocational interest researcher casually decide: I think the time has come for a revision; 20 years have passed since the last one. Users of inventories recognize the potential influence of vocational interest measurement and demand instruments that are progressive and future oriented, instruments that will widen occupational horizons and open the world of work to all rather than constrict individual development and choice.

BASIC ISSUES

Before attempting interest inventory construction and revision, five basic issues must be explored:

1. The criterion sample issue
Is the instrument fair to men and women? Are social class, race, and sex moderator variables? Should different inventories be used with different age groups? What are the appropriate criterion and reference groups? Do they become outdated? What does research show about the rate of change?
2. The item pool issue
Should both sexes respond to the same items? Should activities that have traditionally been assigned to one sex be included? Can effective items that are free of socialization effects be found?
3. The instructions and directions issue
How should the instructions address the subject? Do instructions limit responses?
4. The interpretive issue
What are the implications of administering to women a form developed for men, and vice versa? Are sex-role stereotypes of men and women presented in interpretive materials? Do the profiles list different occupations for men and women? Do manuals and student interpretive materials clearly state that occupations may be for persons of either sex? Should scores be reported for males on female-normed scales for which there are no male counterparts, and vice versa?
5. The legal issue
Does the use of popular standardized interest measures in employment and education constitute a violation of the civil rights of female or male examinees? What are the implications of Title IX of the Education Amendments of 1972 for the continued use of available standardized interest measurement instruments? What legal questions are raised by the use of separate test norms for males and females?

Solutions to these issues and questions can be derived from an assortment of sources. Empirical data answer many of the technical problems and questions; lawyers provide legal guidelines; inventory users submit suggestions and criticisms; advisory committees propose decisionmaking policies; professional commissions contribute expertise and objective guidelines.

Still, many of the issues have several possible solutions; some answers are provisional hypotheses waiting for proof or disproof, and some problems have no immediate solution.

COSTS

A sixth basic issue for publishers and researchers is finances. Who should support the

research centers? Who provides the funds to guarantee thoughtful and careful inventory development? The counselor? The client? The courts? The professional organizations? The advisory committee?

Typically, the publisher assumes financial obligation for revisions and new editions. Scoring services finance development of computerized interpretations; universities may provide physical space; the Federal Government funds career education and guidance projects; a small grant dribbles in here and there. But the primary financial burden for test development remains the publisher's responsibility.

Caught between researchers requesting money and time to insure sound decisions and quality work on one hand and the public expecting the immediate release of better instruments on the other, the publisher does not occupy an enviable position. Test users become impatient with the slow, ponderous movement of test construction, while researchers envision themselves tearing along at breakneck speeds, underfunded and understaffed.

Globally, interest inventories are expensive to develop and revise; the projects are time consuming. But what precisely are the costs? What are the expenses of revising existing inventories or constructing new ones? What are the expenses of developing new interpretive methods and integrating occupational-interest information with other data on an individual? What are publishing costs for a new manual? How are "expensive" and "time consuming" defined? By hundreds of dollars or by thousands? By weeks or months or years?

Sex bias does occur in career interest inventories. The sources of bias must be identified; revisions must be made. Developmental cost is one variable that will affect change in interest inventories and interpretive methods.

The following sections describe the direct costs involved in the development of career interest inventories and in their revisions. Many hidden costs are involved as well. Related occupational literature must change, job titles must become sexually bivalent, many social customs must be modified. If new inventory items must replace biased items, then hundreds of thousands of bits of information may be lost with each item discarded. The effort expended in replacing these bits of data is staggering. Some of these costs remain totally hidden; some are reflected partially in the dollar values assigned to tasks discussed below or in the time lags estimated for various revisions. Yet all of these costs are supportable if the result is a broadened awareness of career opportunities as our modified and improved measurements are used in the counseling of members of our society—especially, of course, in the counseling of women.

Cost and time estimates are made on the assumptions that project details are established and that the research staff is trained and qualified to complete research design tasks. Estimates do not consider expense or time required to determine new procedures and methods, to conduct exploratory studies, to develop new research designs, or to train competent personnel. These factors could have substantial impact on all estimates, doubling or tripling the figures presented.

REVISING INTEREST INVENTORIES

The following steps are necessary to accomplish the revision of an instrument such as the Strong Vocational Interest Blank (SVIB): (1) Select and revise the item pool. (2) Determine a new general reference sample. (3) Revise the existing homogeneous basic interest scales. (4) Revise the existing empirical occupational scales. (5) Collect new criterion samples. (6) Construct new and timely occupational scales. (7) Provide normative and stability data. (8) Improve the profile format. (9) Update test interpretation information. (10) Write a new manual.

Eight basic requirements must be met before attempting such a project:

1. An archival system with easily retrievable data
2. A research psychologist well versed in the desirable characteristics of an interest inventory, sophisticated in empirical research and statistical analysis, and knowledgeable of the history of the inventory—an individual with authority to determine priorities

3. Computer programers sophisticated in programing and knowledgeable of the data storage formats and data analysis programs
4. Research assistants capable of working with a minimum of supervision who are familiar with the inventory being revised and vocational interests in general
5. A secretary skilled in manuscript preparation
6. Clerks, preferably with typing and keypunching skills
7. Access to computer facilities and an optical scanner
8. Sufficient computer time to facilitate a steady production of data

Thus the personnel for an ideally staffed research center would be one professional, two computer programer research assistants, one research fellow, one secretary, and two clerk-typists. The total cost per year to staff such a center would be $77,000.

Machine costs for one year average $10,000, including leases for an optical scanner, calculator, keypunch, typewriters, and substantial computer time. Materials—paper, computer tapes and cards, printing, postage—total $3,000 per year. (Refer to table 1 for itemized estimates of costs for the complete revision of an interest inventory.)

If the personnel involved are motivated and responsible to the project, one can reasonably expect to complete the revision of an instrument such as the SVIB in 3 years for a total of $270,000.

CONSTRUCTING NEW EMPIRICAL OCCUPATIONAL SCALES

A pertinent task for test constructors at this time is the addition to current inventories of new scales that more completely represent the occupational world. Vocational psychologists must now study both men and women within an occupation; they must search out men in nursing and women in optometry; they must expand their inventories to include occupations that in the past have been virtually closed to one sex or the other.

The addition of even one scale to an interest inventory creates the need for several other changes—readjusting the profile, providing additional interpretive information in the manual, supplying reliability and validity data. The major tasks involved are—

(1) locating an occupational source for selecting subjects (for example, finding female funeral directors or male dental hygienists);
(2) collecting the criterion sample;
(3) analyzing the item statistics;
(4) constructing the scale; and
(5) computing reliability and validity data.

Assuming that personnel and machine costs need not be subsidized, the expenses for developing one scale are $1,959. (Refer to table 2 for itemized estimates of material and computer costs.)

The minimum time required to develop a new empirical occupational scale is 4 months. This estimate anticipates an allotment of 3 weeks for criterion sample collection tasks, 8 weeks for subject response, and 5 weeks for data analysis and scale construction. (Refer to table 3.)

Routine tasks, such as compiling a mailing list or editing answer sheets, consume an incredible number of hours. For example, one person working diligently will take 8 days to compile a mailing list, another 7 days to mail out the sample, and 6 days to edit the returned answer sheets. (To facilitate accurate optical scanning of item responses, each answer sheet must be examined to insure that all items are answered, that the marks are dark, and that the name grid is properly completed.)

CONSTRUCTING NEW HOMOGENEOUS INTEREST SCALES

Homogeneous scale construction, using rational or factor analysis techniques, would require a staff similar to the personnel completing interest inventory revisions and new empirical scale construction. Assuming, again, that the individuals are knowledgeable in the field and involved in and committed to the project, and assuming that research was confined to an existing item pool of known reliability and validity, the project could be completed in an intense

TABLE 1.—*Estimated costs for complete revision of an interest inventory*

	Cost per year	Function
Personnel:		
Ph. D. psychologist (full time)	$30,000	Acting as project director (knowledgeable in vocational interest measurement, testing, statistics, and homogeneous and empirical scale construction): coordinating publisher and research center activities; informing profession and public about research activities; training research staff; training other professionals; generating research projects.
Research fellow (full time)	15,000	Coordinating scale construction activities.
2 computer programers (half time)	15,000	Computer programing; data analysis.
Secretary (full time)	8,000	Typing; general office assistance.
2 clerks (half time)	8,000	Keypunching; editing; mailing; collecting criterion samples.
Miscellaneous staff	1,000	Typing labels; mailing back profiles; editing.
Total personnel costs	77,000	
Machines:		
Optical scanner	600	
Keypunch	600	
4 typewriters	1,200	
Calculator	300	
Computer time	7,000	
Miscellaneous	300	
Total machine costs	10,000	
Materials: pencils, paper, printing, computer tapes, postage, labels, envelopes	3,000	
Total costs	$90,000	
Total project time	3 years	
Total project budget	$270,000	

Source: Center for Interest Measurement Research, University of Minnesota.

TABLE 2.—*Estimated developmental costs for construction of new empirical scales for an existing interest inventory*[a]

	Number	Cost	Postage[b] (number mailed)	Total
Materials:				
2 cover letters	1,600	$16		$16
Questionnaire	800	8		8
4 mailing labels	3,200	71		71
Followup postcard	800	68	$80 (800)	148
Second followup	600	16	60 (600)	76
2 9x12 envelopes (800 for initial mailing, 400 for profile return)	1,200	12	216 (1,200)	228
Profile interpretation letter	400	8		8
Return envelopes (#10)	800	8	48 (400)	56
Test booklet	800	32		32
Answer sheet	800	16		16
Miscellaneous		200	100	300
Total materials costs		455	504	959
Computer:				
Profiles	400	400		400
Tapes	4	50		50
Item analysis		100		100
Scale construction		100		100
Validity and reliability data analysis		100		100
Miscellaneous		250		250
Total computer costs		1,000		1,000
Total cost per scale[c]		1,455	504	1,959

[a]Data based on initial mailing sample of 800, rate of return estimated at 400.

[b]Based on postage rates in March 1974.

[c]This estimate does not include personnel or machine costs; these data can be found in table 1.

NOTE—Time and cost estimates begin once the major task of locating an occupational source has been completed.

Source: Center for Interest Measurement Research, University of Minnesota.

TABLE 3.— *Estimated developmental time for construction of new empirical scales for an existing interest inventory*[a]

Task	Time (in days)	
Mailing list (compiling list; typing mailing labels)	8	Time allotment for criterion sample collection tasks: 3 weeks
Mailing sample (preparing master list; numbering answer sheets and questionnaires; color-coding return envelopes; stuffing and sealing envelopes; running envelopes through postage meter)	7	
First followup (labeling postcards; running cards through postage meter)	1	Time allotment for subject response and postmailing tasks: 8 weeks
Second followup (identifying nonresponders; "labeling" followup; running followup through postage meter)	2	
Returns (opening envelopes; selecting usable and unusable subjects; recording receipt; ordering answer sheets by number)	4	
Editing (assigning subject number; copying torn answer sheets; re-marking light responses; filling in name grid properly)	6	
Compiling summary data (calculating mean age, experience, and education; writing criterion sample description)	1	Time allotment for data analysis and scale construction: 5 weeks
Scoring profiles	10	
Returning profiles (separating profiles; stuffing and sealing envelopes; running envelopes through postage meter; addressing envelopes)	2	
Item analysis (calculating item response percentages for criterion sample; comparing in-general sample with criterion sample; selecting cutoff percentage and number of items)	3	
Constructing scales	7	
Compiling reliability and validity data (scoring in-general samples on new scale; constructing mean profile of criterion sample; calculating test-retest correlation; calculating Tilton's percent overlap; computing correlations with existing scales)	5	
Total project time	4 months	

[a]Time estimates based on initial mailing sample of 800, rate of return estimated at 400.

NOTE.—Time estimates begin once the major task of locating an occupational source has been completed.

year of research activity. Tables 4 and 5 outline cost and time estimates.

PUBLISHING

Capital outlay over the years by the publisher of an interest inventory, exclusive of research and development costs, represents an investment of $100,000 to $115,000.

The publisher provides editing, design, and management time; supplies testing materials; and absorbs thousands of dollars of printing, promotion, and publishing costs. Table 6 lists detailed typical expenses of a publisher over a 5-year period, a realistic time frame for developing an inventory properly.

DEVELOPING NEW INTEREST INVENTORIES

A single interest inventory cannot be all-inclusive, providing a profile reflecting every occupational area and level. Possibly a single interest inventory cannot be used with all age levels. Perhaps test constructors should be preparing multiple inventories, each designed for a different specialized group.

TABLE 4.—*Estimated developmental costs for construction of homogeneous scales for an existing interest inventory*

	Cost
Materials:	
Postage, envelopes, test booklets and answer sheets, cover letters, pencils printing, followup postcards, profile interpretation letters	$3,000
Miscellaneous	500
Total materials costs	3,500
Machines:	
Typewriters, calculator, keypunch, optical scanner	3,000
Computer time	2,500
Total machine costs	5,500
Personnel:	
Project director	30,000
Computer programer	15,000
Research fellow	15,000
Research assistant	10,000
Secretary	8,000
Miscellaneous	1,000
Total personnel costs	79,000
Grand total	88,000

TABLE 5.—*Estimated developmental time for construction of homogeneous scales for an existing inventory*

Task	Time (in months)
Defining, collecting, and refining reference sample	6
Constructing scales	1
Compiling reliability and validity data	1
Developing interpretive information—counseling	2
Developing interpretive information—technical	2
Total	12

The decision whether to develop a new interest inventory or to retain and revise an existing inventory must consider the utility of the old versus the new. In terms of financial gains, revisions rarely pay off for the amount spent. However, new inventories, although more profitable, ordinarily cannot provide an extensive body of published information on the inventory or longitudinal studies that establish validity for interpretive data, because of their newness.

To construct a new interest inventory that would feature 30 empirical scales, one would need a budget of $340,000 allocated for a 3-year research period. Personnel alone would use $232,500. This estimate assumes that the project director is knowledgeable in the field. If the director is not familiar in detail with the specifics of interest inventory development, personnel costs could be doubled and project time increased to 5 or 6 years. (Refer to table 7 for personnel, machine, and material costs for developing a new interest inventory.)

The $340,000 estimated research budget for developing a new interest inventory includes the cost of (1) collecting the item pool; (2) generating item validity and reliability data; (3) designing a test booklet, answer sheet, and interpretive profile; (4) collecting criterion samples; (5)

TABLE 6.—*Estimated publishing costs for an interest inventory, exclusive of research and development expenses*

	Cost	Time (in years)
Personnel (editing, design, and management time)	$10,000 per year.	5
Materials (experimental editions, research answer sheets)	$1,000 to $2,000 per year.	5
Printing	$10,000 to $20,000 at time of publication.	
Promotion	$10,000 at time of publication.	1
Publishing costs (warehousing, selling, accounting, general overhead)	$25,000 at time of publication.	1
Total project	$100,000 to $115,000	5

Source: Leon Seltzer, director, Stanford University Press, Stanford, Calif.

constructing 30 empirical occupational scales; (6) providing validity, reliability, and normative data; (7) preparing test interpretation information; and (8) writing a new manual.

Time expended for research and development of a new interest inventory, or for the revision of an existing inventory, is 3 years minimum. The publisher of the instrument is involved with the project for at least a 1-year organizational period prior to the commencement of the research and for an additional year of editing, printing, and promotion after the last scale has been constructed. Table 8 provides an integrated overview of the time schedules for the three processes: revising an interest inventory, developing an interest inventory, and publishing an interest inventory.

DEVELOPING COMPUTERIZED INTERPRETATION OF INTEREST INVENTORIES

The number of scales in interest inventories has burgeoned since 1928, when the manual for the Strong Vocational Interest Blank listed 12 available occupational scales, 11 that were under development, and 6 that were expected soon (Campbell, 1968). The 1966 (Form T399) and 1968 (Form TW398) revisions of the SVIB each had over 80 scales. The latest SVIB revision, Form T325, the Strong-Campbell Interest Inventory, has a profile with scores on 155 scales.

Counselors and clients are faced with a plethora of data—general theme scales based on Holland's theory of vocational types (Campbell & Holland, 1972; Hansen & Johansson, 1972), homogeneously constructed basic interest scales (Campbell, Borgen, Eastes, Johansson, & Peterson, 1968), empirical occupational scales, and empirical nonoccupational scales (Campbell, 1971).

Computerized interpretive profiles assist users of interest inventories in comprehending the increased information and help to minimize information overload

To develop a computerized interpretive analysis of an interest inventory such as the SVIB would require 3 months and approximately $17,000. The project director, a Ph. D. psychologist, must be knowledgeable of the interest inventory's construction and development as well as of interpretive data and methods. Supporting staff would include clerical and computer programer personnel. Table 9 details the developmental costs for a computerized interpretive analysis of an interest inventory.

TABLE 7.—*Estimated developmental costs for a new interest inventory, exclusive of publishing expenses*

	Cost per year	Function
Personnel:		
Ph. D. psychologist	$30,000	Overseeing and coordinating staff; developing item pool; preparing test booklet; designing profile; organizing item analysis; writing manual; overseeing scale construction, reliability and validity studies, and criterion sample collection.
Research assistant	15,000	Collecting criterion samples; constructing scales; studying reliability and validity.
2 clerical personnel	17,500	Typing; mailing; editing; general office assistance; keypunching.
Computer programer	15,000	Writing computer programs.
Total personnel costs	77,500	
Machines:		
Computer	2,500	Program testing; data analysis.
Calculator, copier, typewriter	5,000	Data analysis; preparation of manual; preparation of test booklet.
Total machine costs	7,500	
Materials (paper, pencils, printing)	8,334	
Additional costs ($2,000 per scale for 10 scales developed)	20,000	
Total costs	113,334	
Total project time	3 years	
Total project budget (for 30 scales)	$340,000	

Source: Charles B. Johansson, director of test development, National Computer Systems, Minneapolis.

TABLE 8.—*Integrated time schedules for revising an interest inventory, developing an interest inventory, and publishing an interest inventory*

Year	Revising	Developing	Publishing
1	Consult with publisher.	Consult with publisher.	Assess need for revised or new inventory. Contact knowledgeable researcher. Design experimental edition.
2	Select research staff. Design project. Refine item pool. Revise test booklet and answer sheet. Consult with publisher.	Select research staff. Design project. Collect item pool. Generate item reliability and validity data. Design test booklet and answer sheet. Consult with publisher.	Perform management functions. Finance research project. Consult with researcher.
3	Revise existing scales. Generate reliability and validity data. Begin to write manual. Consult with publisher.	Collect criterion samples. Test subjects. Construct occupational scales. Consult with publisher.	Perform management functions. Finance research project. Consult with researcher.
4	Collect new criterion samples. Test subjects. Construct new occupational scales. Generate reliability and validity data. Finalize profile, test booklet, manual, and interpretive information. Begin informing the public. Consult with publisher.	Complete tasks of technical development. Generate reliability and validity data. Finalize profile and test booklet. Prepare manual and interpretive information. Begin informing the public. Consult with publisher.	Perform management duties. Finance research project. Begin informing the public. Consult with researcher.
5	Consult with publisher. Inform the public.	Consult with publisher. Inform the public.	Perform management functions. Edit the copy. Print the materials, Promote the product. Sell the product. Provide warehousing. Inform the public. Consult with researcher.

TABLE 9.—*Estimated developmental costs for a computerized interpretive analysis of an interest inventory*

	Cost	Function
Personnel:		
Ph. D. psychologist (1/3 time)	$10,000	Developing program specifications; writing explanatory manual; coordinating staff.
Clerk (1/2 time)	4,000	Typing; keypunching; general office assistance.
Computer programer (50 hours)	2,500	Writing computer programs.
Computer	500	Testing program.
Total project budget	17,000	
Total project time	3 months	

Source: Charles B. Johansson, director of test development, National Computer Systems, Minneapolis.

IMPLEMENTING A COMPUTERIZED VOCATIONAL GUIDANCE SYSTEM

The step beyond computerized interpretive analysis of interest inventories is the complete integration of vocational and educational information into a computerized guidance system. Vocational interest data are used most effectively in conjunction with cognitive data such as results from the Differential Aptitude Test Battery (DAT), the General Aptitude Test Battery (GATB), and the Nonverbal Aptitude Test Battery (NATB); the *Dictionary of Occupational Titles (DOT);* the *Occupational Outlook Handbook (OOH);* and an index of job satisfaction.

The Milwaukee Computerized Educational Guidance System (EDGUYD) (Cassel & Mehail, 1973a) and the Milwaukee Computerized Vocational Guidance System (VOCGUYD) (Cassel & Mehail, 1973b) are computer-based search and screening modes of operation, designed to assist in the narrowing of occupational and educational choices by relating the individual's interests to the specific requirements for a particular school or job.

EDGUYD provides orientation and planning experiences for individuals making post-high-school education plans. The system presents for the subject's personal consideration all available 4-year or highly specialized post-high-school opportunities within the United States and post-high-school opportunities of any type within Wisconsin.

VOCGUYD facilitates the development of vocational maturity among secondary students, helping them to narrow personal career choices from among 1,112 basic career areas to 4 or 5 that may be studied more intensively and providing them with orientation in all areas pertinent to career planning and the world of work.

To implement computerized guidance systems such as VOCGUYD and EDGUYD, several basic requirements need to be met:

1. Two counselors knowledgeable in areas of vocational and educational guidance and in the use of instruments such as the Kuder Occupational Interest Inventory (OIS), SVIB, Ohio Vocational Interest Survey (OVIS), DAT, GATB, and resource material such as the *DOT*
2. A project director, who may be either of the two counselors, capable of determining priorities with personal involvement in the task
3. Two clerks with keypunching skills
4. Computer programers sophisticated in routine and micro programing, with the skills to adapt programs economically to the respective computers involved

5. Sufficient computer facilities, computer time, and materials

Two additional requirements have been stated as essential for using the VOCGUYD and EDGUYD systems:

1. Auxiliary programs designed to enlighten participants about testing instruments such as the Kuder, OVIS, DAT, and SVIB
2. Programs to instruct counselors in new developments in vocational and educational psychology such as Bloom's mastery learning, Havighurst's critical development stages, and Loevinger's ego development

The computerized guidance project expenses would include two professionals, two keypunch and clerical personnel, computer time, and computer equipment and facilities—an expense of $57,000. (Refer to table 10 for a detailed estimate of costs.)

The cost for the use of such a program, if the requesting agency has a UNIVAC 1108, a DIGITAL PDP-11, or a Honeywell 6000 computer, is from $100 to $200, or the amount necessary to place the programs on a tape and transport them to the new agency.

SUMMARY AND CONCLUSIONS

Ultimately the elimination of sex bias in career interest inventories will depend on project funding. After the issues of criterion sample, item pool, instructional orientation, interpretation, and legality have been settled, researchers and publishers will have the guidelines necessary for removing, or at least minimizing, sex bias in the use and interpretation of interest

TABLE 10.—*Estimated developmental costs for implementing a computerized vocational guidance system*

	Cost	Function
Personnel:		
Vocational guidance counselor	$25,000	Using knowledge of vocational psychology and usual vehicles designed for such purposes (*DOT*, Kuder, Super, Ohio, Strong) to develop computer search and screening systems for career planning.
Educational guidance counselor		Using knowledge of educational psychology and usual vehicles designed for such purposes (DAT, GED, ITED) to develop search and screening systems for post-high-school education planning.
2 clerks	10,000	Typing; keypunching; general office assistance.
Machines:		
Computer equipment and facilities	10,000	Testing program.
Computer time	12,000	
Total project budget	57,000	
Total project time	1 year	

Source: Russell N. Cassell, professor of educational psychology, University of Wisconsin–Milwaukee.

inventories. Then attention must focus on the issue of finances.

Interest inventory revisions are costly; development of new instruments are equally so. For either project, funding must include a yearly $75,000 to $80,000 allowance for personnel. Construction of one empirical occupational scale costs $1,900 to $2,000; complete revision of an interest inventory such as the SVIB, which represents 45 years of data collection and empirical research, costs a minimum of $270,000; the publishing expenses above developmental costs are $115,000, bringing the expended funds to $385,000. (A rough cost estimate of 40 percent to 100 percent or more should be added to all development costs to reflect expenses of overhead to research-support institutions.)

Revisions also are time consuming. Three years is the absolute minimum estimate for a complete revision. Construction of a new inventory, providing only 20 percent of the scores presented on an instrument such as the Strong-Campbell Interest Inventory, requires 3 years. The development of one empirical scale requires at least 4 months.

To increase the activity of interest inventory research, financial support for researchers must increase. Possible funding sources include—

(1) continued support by publishers, universities, and scoring services;
(2) increased moneys through federal funding;
(3) aid from professional organizations;
(4) funding from special interest groups.

Unfortunately, without outside financial aid, much interest inventory research may be forced to halt and needed revisions of interest inventories may be impossible to accomplish.

REFERENCES

Campbell, D.P. *The Strong Vocational Interest Blank: 1927-1967.* In P. McReynolds (Ed.), *Advances in Psychological Assessment.* Palo Alto, Calif.: Science and Behavior Books, 1968.

Campbell, D. P. *Handbook for the Strong Vocational Interest Blank.* Stanford, Calif.: Stanford University Peess, 1971.

Campbell, D. P., Borgen, F. H., Eastes, S. H., Johansson, C. B., and Peterson, R. A. A set of basic interest scales for the Strong Vocational Interest Blank for Men. *Journal of Applied Psychology Monograph,* 1968, 52(6, pt. 2).

Campbell, D. P., & Holland, J. L. A merger in vocational interest research: Applying Holland's theory to Strong's data. *Journal of Vocational Behavior,* 1972, 2, 353-376.

Cassel, R. N., & Mehail, T. The Milwaukee Computerized Educational Guidance System (EDGUYD). *Education,* 1973, 94, 38-43. (a)

Cassel, R. N., & Mehail, T. The Milwaukee Computerized Vocational Guidance System (VOCGUID). *Vocational Guidance Quarterly,* 1973, 21, 206-213. (b)

Hansen, J. C., & Johansson, C. B. The application of Holland's vocational model to the Strong Vocational Interest Blank for Women. *Journal of Vocational Behavior,* 1972, 2, 479-493.

Strong, E. K., Jr. *The vocational interests of men and women.* Stanford, Calif.: Stanford University Press, 1943.

Sex Bias and Computer-Based Guidance Systems /10

Jo Ann Harris Bowlsbey
WESTERN MARYLAND COLLEGE

ABSTRACT

The rationale for the use of the computer in guidance services lies in its specific capabilities, which can be harnessed to perform guidance tasks by innovative programing. Between 25 and 30 computer-based guidance systems have been developed in the past decade, of which 5 are currently operational: the Computerized Vocational Information System (CVIS), the Occupational Information Access System (OIAS), the Education and Career Exploration System (ECES), the Guidance Information System (GIS), and the System for Interactive Guidance and Information (SIGI). The following conclusions are drawn about the present state of the art in the use of computers in the delivery of guidance services.

1. The surviving systems are direct-inquiry systems; except for SIGI, are directed to secondary school populations; are cost feasible; except for ECES, make use of standard terminal equipment; and specialize in information retrieval, sorting, and synthesis to aid in career decisionmaking.
2. They cost $2 to $12 per student-hour of use.
3. They have enjoyed positive evaluation even in prototype models.
4. Although their use is not widespread, interest is increasing.

Computer-based systems are analyzed in terms of their potential as a sex-fair or sex-biased delivery system. Sex bias or sex fairness may be reflected in any of six components of computer-based systems: the interactive dialog, the data files, the computer program itself, interest inventories used on line or off line, accompanying audiovisual aids, and supporting documentation for the system. Criteria are proposed for determination of sex bias in each of these six components, and each of the previously described five systems is reviewed in the light of these criteria. Further inferences about sex bias or sex fairness are drawn from research on existing computer-based systems.

It is possible that existing systems could be modified at a minimal cost to make them entirely free of sex bias, and the priority order for doing so is suggested. Recommendations are made for minimizing sex bias in the interim between the present and the time of revisions.

COMPUTER-BASED GUIDANCE SYSTEMS: A HISTORICAL PERSPECTIVE

Since the 1950's the computer has revolutionized the procedures of business and industry. By 1960 it had begun to have an effect on the field of education, but only on such administrative and clerical tasks as scheduling, payroll accounting, and production of report cards. The use of the computer by the student directly, for either computer-assisted instruction or guidance, was a later development, having its genesis in about the mid-sixties. This paper, therefore, seeks to analyze the state of a new art, an entirely new delivery system for guidance information, in relation to issues of sex bias and sex fairness. The analysis extends both to the present state of computer-based systems and to their potential as a sex-fair delivery system. The paper will deal with this topic in considerable breadth—well beyond the analysis of interest inventories, which may be part of such systems, and the confines of educational settings.

Computer-based guidance systems are defined as systems that use the computer to contribute to the making of personal, educational, vocational, and social decisions. Such systems typically include data about occupations, colleges, technical and specialized schools, military programs, job placement, and the user.

The computer holds a kind of mystique for many, but in actual fact it is a machine capable only of turning electrical impulses on or off. That so much can be done with this simple concept is a tribute to human ingenuity. Computers do not possess inherent capabilities or inherent good or evil. They possess only the functions, content, and ethics assigned to them by system developers and technicians. Therefore the design of a computer-based guidance system will be only as good as the ideas and creativity of its developers. The information given to users of guidance systems will be only as accurate and as recent as that which the system developer is able to get for input to the system.

RATIONALE FOR THE USE OF THE COMPUTER IN GUIDANCE

The use of technology in guidance services is not a new phenomenon. The profession has depended upon the results of computer-scored tests since these first became available. Further, the profession has been responsive to the availability of multimedia approaches, such as films, tape recordings, video tapes, and games, and has set professional standards for their quality.

In the use of technology in the past, however, the counselor has served as a mediator of the information that the counselee received from the technology. In the case of computer-scored tests, the computer served the counselor, who in turn interpreted the resultant test scores to the counselee. The use of audiovisual delivery systems was also supervised and mediated by the counselor. The new dimension of computer-based guidance systems has been the potential to place the inquirer or counselee directly into communication with large data files of information so that he or she can use them for personal career planning without the mediation of the counselor if the user prefers.

Given the potential of the computer to take on roles previously reserved for human attention, some rationale for doing so seems appropriate. The developers of computer-based guidance systems have recognized several inherent capabilities of computer technology that make it highly usable in the delivery of systematic career guidance:

1. The computer possesses the capability to store and retrieve masses of data. Since it is a general assumption of the profession that increased information increases the probability of good decisionmaking, this capability is a significant one. Further, computer technology allows the capability of instant updating of the information in the data files, thus providing current information for decisionmaking. This function is of course dependent on the availability of current and accurate data to system designers. There is a desperate need for concerted efforts of government agencies and system developers to provide input of appropriate and timely data.

2. The computer possesses the capability to interrelate data by well-planned programing in such a way as to make them personally relevant to the user at the time of decisionmaking. For example, characteristics of students can be re-

lated to characteristics or requirements of occupations; student personal data can be related to the financial aids or local jobs available; student grades and test scores can be related to the entry requirements of colleges.

3. The computer can sort through masses of data in order to provide a personally tailored list of educational or vocational options for the user. With this capability it might, for example, produce a list of colleges in urban settings in the Midwest, with not more than 5,000 students, with a strong major in computer science, and with admission requirements that meet the qualifications of the user. Or it might put together a personally meaningful list of occupations that offer a high degree of security, provide an income of over $10,000 a year, require the skills that the user has to offer, and do not require more than two years of college training for entry.

4. The computer can, through the use of phone-line connections and terminal devices (such as typewriter terminals or TV-like cathode-ray tubes), be programed to simulate a conversation. This allows the construction of structured interviews in which the computer displays a message on a typewriter terminal or a TV like screen and the student responds to the message by typing on a keyboard.

5. The computer can be programed to monitor the student's use of the predesigned guidance system. This allows the capabilities of review with the student upon completion of use of the system or return to it; inconsistencies can be pointed out; patterns of consistency can be reflected; and counselors can be provided with feedback about the student's use of the system.

6. The computer can be programed to allow each student a highly individualized use of the predesigned guidance system, based on his or her own interests and degree of readiness for exploration or planning.

7. The computer can offer this individualized package of services to many users simultaneously, at all hours of the day, without fatigue, and in a variety of places (schools, libraries, shopping malls, and employment agencies, for example).

8. The computer can be programed as a self-regenerating system. Examples of self-regeneration: production of a list of recommended system changes based on computer analysis of on-line evaluation items completed by users of the system; computer-produced recommendations for reallocation of terminal time or placement based on computer analysis of use patterns.

In spite of these reasons for the use of the computer as a delivery system for career guidance, the writer hastens to add that no developer of computer-assisted systems has proposed that computer-based systems be used to replace counselors. The question is one of determining which guidance functions can be performed as well and as economically by computers as by counselors and which functions computers can perform better than humans. The corollary is to thus allow counselors adequate time to provide the services that only humans can provide and to do so in some meaningful interaction with the computer delivery system.

TYPES OF COMPUTER-BASED GUIDANCE SYSTEMS

In 1969 the U.S. Office of Education (Weinstein, 1969) described 10 computer-based guidance systems in its volume *Computer-Based Vocational Guidance Systems.* Also in 1969, Rosser (1969) listed and described 15 commercial college locator services that use a computer to compare the desired characteristics of colleges against data stored in computer storage to produce a suggested list of colleges. In 1970 the *Personnel and Guidance Journal* devoted an entire issue to the topic "Technology in Guidance" (Havens, 1970). Also in 1970, the trustees of the National Vocational Guidance Association saw the movement toward the use of computers in guidance as sufficiently significant to warrant appointing a commission to study issues and to propose guidelines for such use.

This commission (Harris, 1971) published the final draft of its report "Toward Guidelines for Computer Involvement in Guidance" in March

1971. The commission looked at the approximately 25 systems existing at that time and divided them into four broad groups:

1. Indirect-inquiry systems
2. Direct-inquiry systems without system monitoring
3. Direct-inquiry systems with system monitoring
4. Direct-inquiry systems with system and personal monitoring

INDIRECT-INQUIRY SYSTEMS

In an indirect-inquiry system, counselees or clients complete a questionnaire on which they may enter some data about themselves and indicate the characteristics of educational institutions, financial aids, or occupations they seek. Such systems are normally characterized by the following:

1. The counselee's request for data is held until a large group of requests can be processed through the computer program at one time, a procedure normally called "batch processing." Feedback to the inquirer involves a delay of hours, days, or sometimes weeks.
2. The counselee normally goes through this procedure only once. There is seldom opportuniprocedure only once. There is seldom opportunity to examine the first results of the inquiry and to change specifications in order to receive a new set of suggestions. Repeated use is not possible without repeating the initial process and, in commercial services, again paying the initial fee.
3. The data received, such as a list of suggested colleges or occupations, may fail to reflect the inquirer's most important desires and may not report all options open to him or her. Those who develop and distribute such systems write their computer programs in such a way that at least one alternative is suggested, but not an unwieldy number.
4. The indirect-inquiry system does not provide counseling for the inquirer. In this respect it is like a dictionary or an encyclopedia. This function must be performed by the inquirer, the counselor, or another person.

DIRECT-INQUIRY SYSTEMS WITHOUT SYSTEM MONITORING

In a direct-inquiry system without system monitoring, the inquirer (counselee or counselor) has direct access to the data file by operating some type of terminal (Teletype or printer) connected directly to a computer. The counselee or counselor, provided with a set of instructions and code words, uses a keyboard for direct communication with the computer to call up the desired data. These systems are ordinarily programed so that a list of colleges or occupations cannot be called for until the inquirer reduces the possible number of items in the list to a reasonable number, say 25 or fewer, by specifying the characteristics that the items (colleges or occupations) must have. Ordinarily such systems also sequentially report the number of items or options still remaining in the list after the user makes each selection of a characteristic.

The Guidance Information System operates on these principles. Direct-inquiry systems without monitoring have the following characteristics:

1. The inquirer's request for data receives almost immediate attention.
2. By immediate reshuffling of specified characteristics or by repeated later use of the system, the inquirer's use may be multiple or sequential.
3. The computer program may allow the inquirer to receive a reasonably complete list of educational institutions or occupations that fit criteria. Whether or not a complete list can be called, the inquirer is continually aware of the filters that diminish or expand the list of alternatives, because these filters have been applied by the user.
4. There is no counseling for the inquirer, unless by means of printed instructions. Such systems are normally designed to promote live counselor participation.

DIRECT-INQUIRY SYSTEMS WITH SYSTEM MONITORING

Monitoring, in computer systems usage, can be defined as the overseeing capability of the

computer program, which keeps a record of alternatives chosen by the user, has pertinent data about the user, relates these data to the chosen alternative, comments on the consistency of these two in accordance with a decision table determined by the system designer, states the probability of success in appropriate alternatives, and reviews a path of decisionmaking. Such functions, programed by the system designer, simulate a formalized type of counseling.

In a direct-inquiry system with monitoring, the inquirer is also in direct communication with the computer by means of a terminal device. In this type the terminal device is more likely to have some visual capabilities, such as a cathode-ray tube or filmstrip projection potential, rather than a Teletype or printer device.

Examples of this type are ECES (the Education and Career Exploration System of IBM), CVIS (Computerized Vocational Information System, Willowbrook High School, Villa Park, Ill.), and SIGI (System for Interactive Guidance and Information, Educational Testing Service). The characteristics of this third type are as follows:

1. The request of the inquirer (counselee or counselor) for data is processed immediately.

2. The counselee's use is typically multiple or sequential.

3. The counselee has available a variety of scripts, approaches, modes, and branching opportunities that allow flexibility.

4. The data files generally are accessible by various means—for example, directly (as in the second type) or by means of scripts that have monitored the user's prior response or operate from previously filed data about the user.

5. The system very often stores data about the user, obtained during the interactive process or previously, which can be meshed with data about occupations, educational opportunities, military information, and the like to generate personalized or new data.

6. The system provides some formalized counseling through this monitoring.

7. The system monitors the decisionmaking path of the inquirer and displays it in order to facilitate understanding of the decisionmaking processes, to point out inconsistencies, or to review. The system may also report the results of its monitoring to counselors so that they can participate in the counseling process.

DIRECT-INQUIRY SYSTEMS WITH SYSTEM AND PERSONAL MONITORING

A direct-inquiry system with system and personal monitoring is programed to fulfill the functions outlined for the two direct-inquiry systems, with and without system monitoring. This fourth type adds the capability for the inquirer to personalize the system monitoring procedures (the computer program). This requires that the inquirer be made aware of how the predesigned computer program functions and how to modify it "on line" by use of one or more of the available author languages.

The ISVD (Information System for Vocational Decisions of Harvard University) is an example of this type. In the ISVD, effort was made to program the system monitoring in English in order to permit inquirers to modify the system programing with a lesser amount of instruction and trouble. Characteristics of the fourth type include the following:

1. The characteristics of the second type
2. The characteristics of the third type
3. A capability that allows an inquirer to modify a few commands and procedures in the monitoring system (computer program) and in turn direct the guidance system to use a personal monitoring device rather than be required to rely entirely on the system's predesigned program

Ideally, this system would allow its inquirers to have even more flexibility in access to files so that they are not bound by inflexible, prescribed programing steps and multiple-choice responses. This concept implies extremely talented programing, highly sophisticated computer equipment, and high cost at this time. This fourth type caters to the ultimate in sense of agency for its users.

FIVE EXISTING SYSTEMS

Since the writing of the 1971 National Vocational Guidance Commission Report, computer-based guidance systems have been put to the test of operation, effectiveness, and cost feasibility. As a result, all of the 15 commercial indirect-inquiry systems listed by Rosser (1969) have gone out of business. Two later and better models are still struggling for existence. The outstanding example of a direct-inquiry-without-monitoring system, the Guidance Information System, remains strongly in the field. Four direct-inquiry-with-monitoring systems are in daily operation. The ISVD, the one example of the fourth type of system, is now shelved because of the high cost and complexity of operation.

This section of the paper will review briefly the status of five operational systems. All five utilize time-sharing computing—that is, terminal devices are hooked via phone lines to a large central computer. This type of system allows the use of a computer program by multiple users in various locations. The computer services these terminals in rotation, but at such a high speed that it appears all sites are being serviced simultaneously. Typically, a student user "interacts" with the computer by pressing appropriate keys on the terminal device. The computer, in turn, "responds" to the student by sending messages to the terminal device. Further, all of these systems have been designed for and are being used by individuals at the seventh grade level and above.

COMPUTERIZED VOCATIONAL INFORMATION SYSTEM (CVIS)

CVIS, developed at Willowbrook High School (Villa Park, Ill.) and largely funded by the Illinois Division of Vocational and Technical Education, has three distinct subsystems. The first and largest provides career-guidance experiences for direct student use. The guidance subsystem has 10 distinct subsystems: (1) the exploration of approximately 400 occupations in an organized way and in relation to personal data about the student (for secondary level); (2) general information about four-year college planning and a search strategy for finding colleges with desired characteristics from a data file of 1,510 four-year accredited institutions; (3) detailed information about local community colleges; (4) general information about specialized and technical schools and a search strategy for finding local ones that have training programs needed for occupations specified by the student; (5) general information about apprenticeships and specific information about entering apprenticeships locally; (6) general information about jobseeking and a search strategy for finding local job openings; (7) general information about the military service, ROTC programs, and military academies; (8) a search strategy to find financial aids applicable to the searcher; (9) a program to assist the user in reviewing his or her own school record to date and in registering for the following year's courses in keeping with the school's graduation requirements and the student's personal career plans; (10) a program to help students of junior high school age explore the world of work by means of Holland's six vocational personality clusters.

The second CVIS subsystem provides counselors and administrators with a host of on-line computer functions, including display of student records, updating of texts and data files, scheduling of students, schedule changing, attendance keeping, and monitoring of student use of the system.

The third CVIS subsystem provides teachers with an easy author language for the construction of computer-assisted instruction units and a basic monitoring program for the operation of these units.

CVIS is programed in basic assembly language and is therefore easily usable on IBM 360 and 370 computers. Its programs have been modified to make use of a variety of cathode-ray tube and typewriter terminals. The program is in the public domain and available to nonprofit educational institutions at a nominal cost. The computer program with its supporting documentation has now been distributed to 90 school districts in the United States. These sites range from middle schools to four-year colleges and from single-terminal installations to installations of 80 terminals. An active consortium of

users has been formed for the sharing of modifications, evaluation, and costs of updating data files.

OCCUPATIONAL INFORMATION ACCESS SYSTEM (OIAS)

OIAS is the computer-based information retrieval component of the Career Information System, a statewide interagency consortium designed to provide current labor-market information for individuals, schools, and agencies in the State of Oregon. It was developed at the University of Oregon through a grant from the U.S. Department of Labor.

The system is made up of six components. The first is QUEST, an introductory questionnaire that helps students assess their own interests and abilities. Students complete this questionnaire off line and then enter their responses at the computer terminal. At this point the computer produces, from a data file of 230 occupations, a list of those occupations which would meet the specifications set by the user. The student is encouraged to explore different occupational alternatives by changing the responses to the questionnaire items and receiving different lists.

The second and third components of the system are the occupational data file and the training data file. After the computer has produced a list of feasible occupations, the student may ask for a 300-word summary of each of the occupations, including state and national labor-market information, the nature of the work, and working conditions. Further, the education and training data file may be called on at this point to make a list of the educational and training opportunities in Oregon for the occupations being considered by the student. Further development of educational information is currently under way.

The fourth component of the system is a bibliography of materials about occupations. The fifth is a collection of taped interviews with workers in each of the occupations, and the sixth is a computer-stored file of names of local people who are willing to discuss their occupation with students considering it. The computer provides the user with information about the availability of the interview cassettes and the local visitations as individual occupations are considered.

OIAS is also written in basic assembly language and readily usable on IBM computer equipment; a later version of the program has been written in basic language for operation on a Hewlett-Packard 2000C configuration, making use of typewriter terminals. OIAS is fully implemented in 200 schools of the Eugene and Portland metropolitan areas and the southern Oregon coast area, serving a majority of the junior and senior high school students of the State as well as community colleges, four-year colleges, and social agencies.

EDUCATION AND CAREER EXPLORATION SYSTEM (ECES)

The first version of ECES was designed and implemented by the Advanced Systems Development Division of the International Business Machines Corporation. After field trial the system was substantially modified and implemented in the schools of Genesee County, Michigan, with substantial funding from the Mott Foundation. In late 1971, IBM discontinued development of the system and placed the program in the public domain.

ECES makes use of two pieces of equipment in order to assist the user with career planning. The first projects, under computer control, a film image display. The film images are contained on cassettes which the student is instructed to insert at appropriate times in the exploration process. The device is used for the presentation of standard messages, which all students would receive, and for graphic and pictorial displays. The second piece of equipment is a typewriter terminal, used to relay information that is tailor-made for the student and contains data from her or his personal record.

ECES provides three on-line components and one off-line component. The first of these affords an opportunity to explore 400 occupations. The system contains 18,000 individual color film images, including 1,000 on-the-job pictures and 1,000 simulated work problems. The second component is used for exploration of majors, or 400

postsecondary programs of study. This section informs the student about high school and college courses required to qualify for a particular occupation, including description of 6,000 courses. The third component is made up of charts that allow the personalization of the exploration process by integrating information about the student's abilities and interests with information about the occupations or majors under consideration. It organizes the data into useful displays which are printed by the typewriter so that they can be kept by the user. The fourth component, off line and in batch-process mode, is the Institutions Finder. It allows the user to complete a questionnaire indicating the size, geographic location, entrance requirements, and other characteristics desired of colleges, junior colleges, or technical-specialized schools. The data gathered on this questionnaire are then run against the computer-stored data file of schools, and a list of viable options is printed for the user.

ECES is currently operational in several schools in Genesee County, Michigan. Extensive revisions have been made in the guidance system and in the equipment configuration. ECES is currently available under a lease arrangement with Carkhuff Associates.

GUIDANCE INFORMATION SYSTEM (GIS)

GIS was initially developed by a small private company in Boston, Massachusetts, which included among its staff several who had worked on the ISVD at Harvard University. The system provides an interactive search strategy for identifying a list of colleges, occupations, technical-specialized schools, or financial aids that have the characteristics desired by the user of the system. The user is provided with a booklet listing all the characteristics of colleges, specialized schools, occupations, or financial aids that can be used in a search. The student enters desired characteristics one at a time and is told by the system after each entry how many options still qualify. The system provides maximum flexibility for adding or deleting characteristics and for movement from one data file to another. Besides a tailor-made list, the system yields descriptive information about the colleges, technical schools, occupations, or financial aids on the generated lists. Contrary to the three systems previously described, no personal data about the user are stored.

GIS is currently a commercial operation offered by Time Share Corporation (Hanover, N.H.) and Houghton Mifflin (Boston). Computer service and data files are provided by a lease arrangement through regional telecommunications networks attached to Hewlett-Packard 2000C processors. Individual schools that subscribe to the service install teletypewriter terminals and make use of regular voice-grade phone lines.

SYSTEM FOR INTERACTIVE GUIDANCE AND INFORMATION (SIGI)

SIGI is under development at Educational Testing Service in Princeton, New Jersey. Financial support has been provided by the Carnegie Corporation and the National Science Foundation. The target population of the SIGI system is community college students, and the primary goal is to help users make better career decisions through the application of an informed decisionmaking process.

SIGI has four major subsystems: Values, Information, Prediction, and Planning. The Values subsystem presents the user with 10 occupational values: high income, prestige, independence, altruism, security, variety, leadership, interest, leisure, and early entry. Users are asked to assign a degree of importance to each of these by distributing a fixed sum in any way they choose. Discrepancies and conflicts of values are tested by the playing of a values game which presents a series of dilemmas. Playing the game may result in reassessment of the priority order in which the values were first placed.

The Information component of SIGI provides both a search strategy and an information retrieval capability. The five values rated highest by the user are used by the system to search the data file for occupations that will satisfy each of the values at the level set by the inquirer. This search strategy produces a list of occupational options. The user may then ask for specific information about each of these options or

for individual elements of information about two or three occupations simultaneously for the purpose of comparison.

The Prediction subsystem allows the user to receive predictive statements about his or her probability of success in given courses or curriculums related to an occupational choice at a given community college or colleges. These statements are based on locally built experience tables that utilize the experience of past graduates and the high school rank and selected test scores of the user. The Planning subsystem assists the student with specific step-by-step planning from the present point to implementation of career choice.

SIGI is designed to operate either as a stand-alone system with a local minicomputer or as a remote service with a larger central processor serving a number of schools via telephone lines. A PDP-11 minicomputer is currently being used with cathode-ray tube terminals. SIGI is now undergoing a field test, and plans for broader field tests and dissemination are in process.

SOME CONCLUSIONS ABOUT THE PRESENT STATE OF THE ART

1. Of the 25 to 30 computer-based guidance systems that have undergone development, 5 are predominant in the field at this time. They have certain characteristics in common: *(a)* They are direct-inquiry systems; *(b)* with the exception of SIGI, they are directed to school populations at the secondary level; *(c)* they are cost feasible; *(d)* with the exception of ECES, they make use of standard terminal equipment; and *(e)* they specialize in assisting with information retrieval, sorting, and synthesis for the purpose of career decisionmaking (and SIGI goes beyond this).

2. Computer-based systems are costing approximately $2 to $4 per student-hour of use. The inclusion of a variety of counselor-support and administrative-support functions to form an integrated educational package, as in CVIS, holds high potential for minimizing the cost of student use by maximizing the cost savings and efficiency inherent in such functions as scheduling, schedule changing, and attendance keeping.

3. Computer-based systems have received positive evaluation even in these early prototype models. In such evaluation there has been fairly general agreement on the following conclusions: *(a)* Students like to use computer-based systems, easily learn to operate them, and do not feel dehumanized or depersonalized by them (Harris, 1972a). *(b)* Parents accept computer-based systems with enthusiasm (Myers et al., 1972). *(c)* Students who use computer-based systems show an increase in vocational maturity as measured by instruments of vocational maturity, specifically Super's Career Development Inventory (Harris, 1972b; Myers et al., 1972). *(d)* Students who use computer-based systems indicate that they gain greater specificity of information about options, increase their alternatives, achieve crystallization of vocational planning, and engage in a variety of exploratory behaviors to gain further information about career options (Harris, 1972b). *(e)* Some guidance-related functions (selection of high school courses and occupational exploration) can be as effectively performed by a computer system as by counselors (Melhus, 1971; Price, 1971).

4. The use of computer-based systems is not currently widespread. Interest is increasing, however, as evidenced by the expanding distribution of CVIS, OIAS, and GIS.

5. In view of the cost and complexity of development of computer-based systems, the variation of computer language and hardware, and the difficulty of collecting accurate and updated information, progress could be made in this field by the alliance of government agencies and software developers in order to pool funds and efforts.

POSSIBLE SOURCES OF SEX BIAS IN COMPUTER-BASED GUIDANCE SYSTEMS

The National Institute of Education has proposed the following tentative definition of sex bias:

> Within the context of career guidance . . . any factor that might influence a person to limit—or might cause others to limit—his or her consideration of a career solely on the basis of gender.

Before reviewing the status of present computer-based guidance systems, it is necessary to

look at the component parts of such systems in order to fully understand their potential for sex bias or sex fairness. Sex bias or fairness may exist in any of six component parts: the interactive dialog, the data files, the computer program, the testing instruments used on or off line, supporting audiovisual material, and supporting printed material. Let us analyze each of these components in some detail.

INTERACTIVE DIALOG

The text, dialogs, or scripts of a computer-based system are the sum total of interactive dialog that the computer system prints or writes for students on a terminal device in response to their use of the system. Such dialog is written by the designers of a computer system and stored in computer memory or file storage. A pertinent question for testing the dialog for sex bias would be: Is there anything in the tone, content, or language of the prestored computer-student dialog that may cause the user to limit consideration of a career solely on the basis of gender? A flagrant (and fictitious) example: "Boys who are interested in learning more about becoming veterinarians should read pages _____ in the *Occupational Outlook Handbook*." A more subtle example: "The following men in the community are willing to talk to students who are thinking about becoming veterinarians."

DATA FILES

The data files of a computer-based guidance system are often quite separate entities from the computer program itself or the interactive dialog. They are typically files of specific information about occupations, schools, and financial aids. Such information may be in free verbal form or consist of a series of coded characteristics. CVIS provides an example of both. The occupational data file is in the form of 300-word occupational briefs that describe job duties, training requirements, working conditions, employment outlook, opportunities for promotion, and benefits/limitations for each of 377 occupations. The college data file, on the other hand, consists of a string of coded characteristics for each of 1,510 colleges. The codes indicate size range, cost range, majors offered, type of control, type of community in which the institution is located (rural, urban, suburban), degree of selectivity, and so on.

Data files are a second potential source of bias in computer-based systems. The criterion question here is: Are there any elements in the data file or in the titles of the elements in the data file that might influence a person to limit—or might cause others to limit—his or her consideration of a career solely on the basis of gender? The problem of nonbiased occupational titles is a large one. Bias can be conveyed, for example, by the occupational title "automobile salesman."

Beyond occupational titles, there is real potential for sex bias in the specific content and wording of occupational descriptions. A job description of beauty operator that consistently uses the feminine pronoun ("she cuts hair, gives permanents; she must have good ability to meet the public") can subtly imply that this occupation is for women only. The reverse is true of an occupational description of engineer that begins every sentence with *he*. Another issue in regard to content is whether or not specific figures should be reported about the percentages of women or men in a given occupation. Does the conveying of the fact that 95 percent of the workers in a given field are men or women bias users of the system against that occupation, or does it simply inform them of the current state of affairs in the occupation so that a decision can be made with maximum information? Do statements such as "Opportunities for both men and women are increasing in this field" or "Opportunities for women are increasing while opportunities for men are decreasing" help to dispel bias? These are topics that need further research, although a position on them is taken later in this paper.

COMPUTER PROGRAM

A third source of sex bias or fairness in computer-based systems may be part of the computer program itself. Four of the five systems de-

scribed above make extensive use of a computer-stored student record that includes the user's sex. This can be a significant source of potential bias or fairness if the computer program is written in such a way that it says, "Determine the user's sex. If the user is female, use this set of test norms and display this list of occupations. If the user is male, use this set of criteria and display this list of occupations." The criterion question here is: Is there any instruction in the computer program that limits the kind or number of occupations presented to the user as options because of gender?

INTEREST INVENTORIES

A fourth source of sex bias or fairness in a computer-based system could be the interest inventories used in conjunction with the system. Such inventories can be home-made questionnaires or commercially published and normed instruments. They can be administered on line at the terminal with immediate computer scoring, or they can be preadministered and the results entered in the student's personal record. Further, they can be used to give direction to exploration or as *the* search strategy for generating a list of occupational alternatives. To the extent that such instruments are sex biased when used independently, any computer-based guidance system in which they are used to guide exploration of occupations will also be sex biased. Indeed, any sex bias that such instruments have may be magnified in a computer-based system because of the kind of power the computer has as a delivery system. The criterion question is: Are sex-biased interest inventories used as a part of or in conjunction with the system?

(Some interest inventories now provide computer-printed interpretation. Although this use of a computer in relation to interest inventories is outside the scope of this paper, it is an area that also bears investigation.)

AUDIOVISUAL AIDS

Accompanying audiovisual aids are a fifth source of sex bias or fairness in computer-based guidance systems. Such aids may be materials used to orient the students to the system itself, to explain the classification system of occupations used in the system, to show "live" working conditions, or to present simulated work problems. If all workers shown in some occupations are female, while all workers shown in other occupations are male, our present stereotypes about which occupations can be filled by which gender can be very powerfully reinforced. The criterion question is: Are audiovisual aids used in conjunction with the system that cause persons to limit career options on the basis of gender?

SUPPORTING MATERIALS

Finally, the supporting documentation material that ordinarily accompanies a computer-based system can be a source of sex bias or fairness. Such material includes counselor manuals, student manuals, and general informational pieces that are released to the public. Instructions such as "Girls may want to look especially at the occupations in the Service and General Cultural categories" or "Boys may want to pursue their vocational interests by spending a day on the job with some of our local businessmen" illustrate the potential for bias in such material. The criterion question is: Does any of the content of the supporting documentation influence users to limit career options on the basis of gender?

REVIEW OF EXISTING SYSTEMS FOR EVIDENCE OF SEX BIAS

Preparation for writing this section of the paper was done by collecting as much information and as many samples of materials as possible from each of the five existing computer-based systems. Where necessary, direct contact was made with the project director and printouts of interactive dialog, sample data-file printouts, program descriptions, and user manuals were requested. A great deal of printed material was collected about all five systems. However, its comprehensiveness varied considerably. Because of the writer's association with

CVIS, that system was available in its entirety. GIS was viewed in demonstration, and its student manual was studied. All ECES printouts and written descriptive material were read, but since its interactive dialog is on film image, this part of the system could not be scrutinized. Only descriptive material about SIGI was available without on-site visitation, but extensive conversation was held with the project director. A very good sample of all functions of OIAS was studied. The writer is indebted to Janis Brockhoff, a graduate assistant at Northern Illinois University, who read this tremendous volume of material and made extensive notes. Each of the five systems will be analyzed within the framework of the six possible sources of sex bias or fairness just presented.

INTERACTIVE DIALOG

CVIS has a great deal of interactive dialog and all of it was read. Some bias was found, as follows:

1. The CVIS military script, written in 1971, has a branch for men and a branch for women, an organizational scheme necessary at that time. The whole military subsystem is currently being rewritten to reflect the new equality of sexes in the military.
2. In the junior high vocational exploration subsystem, occupations are presented for exploration in the six Holland clusters. There is inconsistency in the way these six occupational groups are described. The characteristics of workers in some groups have been very carefully described without the use of any personal pronoun. The word *he* seems to creep into the description of roles in the Scientific and Realistic groups.
3. At the end of the junior high vocational exploration subsystem, students receive assistance in thinking about course registration for high school. In describing the kinds of vocational-technical programs available at the high school level, auto mechanics and drafting are given as examples for boys, typing and shorthand for girls.
4. In the high school vocational exploration subsystem, occupations are classified by Roe's (1956) eight categories. These categories are described to students, with sample occupations at various educational levels. A variety of job titles was used, including "typical" occupations for both men and women. However, when a job title was used that has two forms, one feminine and one masculine, the masculine form was consistently chosen—for example, actor (not actress) and policeman (not police woman).

OIAS and GIS have a minimum of interactive dialog. The purpose of the dialog is to help the user identify characteristics so that these can be used in a computer search strategy. Neither of these systems has lengthy informing, clarification, or simulation material similar to that of CVIS, ECES, and SIGI. Samples of the GIS and OIAS text were read for evidence of sex bias, and none was found in either system.

ECES has two modes of communication with its users—a predetermined dialog that appears on film images, and charts prepared with individualized information. It was not possible to go to Flint, Michigan, to read the film images. The charts were read and no evidence of bias was found.

SIGI is still under development and field test in New Jersey. No samples of text could be obtained without visiting the development site. From phone conversation with Dr. Martin Katz, the project director, it was evident that very careful attention has been paid to assuring sex fairness in the writing of interactive dialog. Sentences in the planning section have recently been revised in examples like the following: "Ask your financial aid officer about them. He can tell you" was changed to "Ask your financial aid officer, who will tell you . . ."; "He will help you" was changed to "Your counselor will help you."

DATA FILES

The list of occupations included in each of the five systems was read. All five systems are struggling with the problem of inconsistency in job titles. Within the same listing, great care

may be taken to identify both *policeman* and *policewoman, waiter* and *waitress, busboy* and *busgirl,* and to use *salesperson (house-to-house),* while *real estate salesman* and *automobile salesman* are listed in masculine form only. It is evident that this is a problem to which all producers of occupational information are addressing themselves. Some titles, however—such as *setup man, draftsman,* and *milkman*—are very awkward to unbias.

Turning specifically to CVIS and its occupational data file, it became obvious from close reading of a sample of the 377 occupational briefs in the system that they were written by three or four writers. This data file has just been rewritten and updated by the J. G. Ferguson Publishing Company, under contract to the CVIS Consortium. Some of the occupational briefs are written very skillfully, with total avoidance of the pronouns *he* and *she.* Others, when describing job duties, consistently refer to "he" for such occupations as load dispatcher, phototypesetter, political scientist, professional athlete, university professor, ship captain, and veterinarian and to "she" for such occupations as model, receptionist, dental hygienist, dietitian, and floral designer. Inconsistency was also found in the wording of statements about employment outlook. Most occupational descriptions say "Employment outlook in this occupation is good (steady, declining, increasing)." Some say "Employment outlook for both men and women is . . . ."

Subtle kinds of bias were also found in the wording of some CVIS occupational briefs, as in the following examples:

Home Economist	. . . many graduates work a short time before marrying, then leave to raise their families . . .
FBI Agent	. . . and wear business suits . . .
Boiler Operator	. . . most men in this field . . .
Cameraman	All engraving may be done by one man . . .
Production Manager, Advertising	. . . many successful advertising men . . .
Pilot	. . . most men begin as co-pilots . . .

There was considerable consistency about the reporting of the proportion of women in each occupation. Examples:

Architect	. . . the percentage of women in the profession is small . . .
Assembler	. . . about half of all assemblers are women . . .
Cashier	. . . four out of five cashiers are women . . .
Hotel Housekeeper	. . . the majority of hotel housekeepers are female . . .
Metallurgical Engineer	. . . with opportunities for women increasing . . .

OIAS stores 230 occupational briefs, each approximately 300 words in length. Seven sample briefs were obtained for reading. The problem of the use of *he* and *she* has been avoided by using *they* or incomplete sentences without subjects. No oblique sex bias was found in the content of these job descriptions. OIAS occupational descriptions report the employment outlook for both sexes when special opportunities for women or other groups of jobseekers can be found. Examples:

Urban Planners	Prospects are good for qualified women and minority group members.
Architect	Women and minority members are reportedly in demand.
Ecologist	Opportunities are good for qualified women and minority group members.

The "Current Local Outlook" section of the OIAS occupational briefs reports current data about the proportion of workers by sex. The ability to do this is dependent both on the constant availability of such data and on the availability of computer updating programs.

In a sense, the *Dictionary of Occupational Titles* serves as a data base for OIAS, since students are referred there for additional information. A random sample of occupations and worker trait groups was read in the *DOT.* On the whole, sex bias was not evident. Occasionally in the worker trait group description of training and methods of entry, there is reference to "he." For example, the description of

contract negotiating says, "It is only after considerable exposure that he may be expected to function at full capacity."

The ECES occupational data file is in the form of 18,000 color film images which include on-the-job pictures showing real work situations and problem situations that people in those occupations are trying to solve. This data file could therefore not be read. Additional comments are included under the section on visual aids.

The GIS data file consists of the *DOT* characteristics and definitions of 1,300 occupations. To the extent, therefore, that the *DOT* definitions and worker trait group characteristics have sex bias, the GIS data file has bias.

The SIGI data file consists of the responses to 27 questions that users may ask about any single occupation or for the sake of comparison of one occupation with another. One of the questions the student may ask is "How many women are in this field?" Typical responses to this optional question: "35% women"; "less than 2% women"; "mostly men, number of women still growing"; "very few women—the heavy lifting may discourage women." During the last revision of SIGI's 119 occupational descriptions these were scrutinized for possible sex bias. Wherever a sex-biased reference was found, occupational descriptions were rewritten. The following description of stewardess provides an interesting example (the title has been changed to flight attendant):

> *Personal Characteristics*
> Should be attractive, poised, tactful, and resourceful young woman, aged 19-27, height 5'2"-5'9", with pleasant speaking voice and good vision. Must usually be unmarried when hired, but may continue work after marriage.

The revised version:

> *Personal Characteristics*
> Should be attractive, poised, aged 19-27, have a pleasant speaking voice, good vision, and be in excellent health. Weight and height should be in proportion: men, from 5'3" to 6' and not over 180 lb., and women, from 5'3" to 6' and not over 155 lb.

COMPUTER PROGRAM

The computer program itself can be responsible for sex bias. CVIS provides only one example of this potentiality, although if there is bias it lies outside the control of the system designers. In the financial aids search program, the sex of the user is determined. If the user is female, all financial aids that are available to males only are excluded from the search; if the user is male, the opposite is true.

OIAS uses an instrument called QUEST, which was developed at the University of Oregon. It is a 25-item questionnaire that elicits preference for *DOT*-type characteristics so that these can be used for searching the occupational data file. Item 7 of that instrument asks users whether they prefer to work in an occupation that is filled primarily by men or by women, or whether this is not an important consideration. The response to this item is used as one characteristic by which to sort possible occupational options. The project director has indicated that most students say the proportion of workers by sex is not important as a characteristic; therefore the question will be eliminated.

SIGI has a potential for sex bias in its Planning and Prediction section, although there is no evidence that this potential is in fact realized. Based on the user's rank in class and scores on the Comparative Guidance and Placement Test, predictions are made about success in given curriculums as indicated by the experience of others with similar rank and scores. This provides a potential for comparing the scores of women users with female norm groups and the scores of men users with male norm groups. In the past the program has given a nursing example for females and an accounting example for males. This has been changed.

INTEREST INVENTORIES

The use of interest inventories introduces another potential for sex bias. CVIS makes use of Kuder CH prestored data if they are in the student record in the secondary-level vocational exploration subsystem. The use of the Kuder is not at all integral to the system. Roe (1956) did some research to relate the scales of the Kuder CH to the eight categories of her classification system. Since it is the custom at Willowbrook High School for sophomores to have a vocational unit in which the Kuder is given, these scores

are stored as a part of the individual student record. When the student uses the vocational exploration subsystem, the eight Roe categories are explained and the student is asked to choose one of the eight for exploration. If the one chosen is a field in which a score on the Kuder, administered earlier, was above the 75th percentile, the computer responds, "You showed interest in this field on the last interest inventory you took." On the other hand, if a field is chosen in which there was no previous score above the 75th percentile, the message is: "This is a new area of interest for you. Go ahead and explore it. The last time you took an interest inventory you indicated interest in Science, Technology, and Outdoor." Thus interest inventory scores are used only to point out consistency or inconsistency between past interest inventories and present exploration choices. If the student has not taken an interest inventory, the above messages are bypassed by the computer program. The Kuder CH has different norms for males and females. To the extent that this instrument has sex bias, it is reflected in a tangential way in CVIS.

Item 24 of the QUEST instrument used in OIAS seems to infer that "assisting" is a female role:

> *Assisting*
> Would you like a job where you have to be pleasant to many different customers or other workers while you give or get instructions? Waitress, sales clerking, stewardess, library, and reception work are examples of assisting jobs.
>
> *Yes*, I would consider jobs where this is part of the work. I do *not* want a job with a lot of assisting.
> *No preference* or not sure.

ECES makes use of the Ohio Vocational Interest Survey and Science Research Associates' Vocational Planning Inventory. These instruments are administered to students off line in guidance groups. The student receives these profiles along with a search strategy that has been printed by the computer as one suggested plan in researching occupations and majors. Again, to the extent that these instruments have sex bias, that bias will be reflected in the computer's suggested plan for exploration.

GIS does not make use of any interest inventories. Users' search of the data bases is determined solely by their choice of characteristics desired. The computer uses this combination of characteristics for its search.

SIGI does not make use of any interest inventories. There is a Values component in which users assign a weight to each of 10 work values and then play a simulation game that forces them to look at value conflict and decisionmaking in relation to values. The text of this material has been recently revised to assure that approximately half of the simulated problems involve female subjects and half involve male subjects. A potential problem is that certain values may be stereotypically considered by systems users to be female (altruism, security) or male (prestige, independence).

AUDIOVISUAL MATERIALS

CVIS makes use of two types of visual materials in conjunction with the computer system. The first is a 10-minute slide-tape presentation that explains the Roe classification system used in the secondary-level vocational exploration subsystem. This system divides all occupations into six levels by training and responsibility and eight fields of interest (Service, Business Contact, Organization, Technology, Outdoor, Science, General Cultural, and Arts and Entertainment).

Since the names of these eight fields, as well as the meaning of the six levels of training, need explanation in order to have meaning for the student, the audiovisual presentation was prepared for showing to groups or individuals prior to use of the system. The definitions of the eight fields are illustrated by cartoons. The kinds of workers in each of the eight fields and in the six levels are illustrated by pictures of workers on the job in the local community. Care was taken to represent both men and women in each level of jobs in these pictures.

The CVIS junior high vocational exploration subsystem is supported by 12 audio-filmstrip cassettes, 2 about each of Holland's 6 clusters of occupations. The first set indicates the kinds of interests and abilities young people are likely to have at the junior high level if they are to find satisfaction in the given Holland cluster of

occupations. These 6 productions are well balanced in terms of sex representation. The second set shows 10 to 15 representative occupations in each of the 6 clusters. The cassettes show adult workers in typical work settings and describe their work activities. Since these productions were homemade and photographed in the local communities, our sex representation was largely subject to the kinds of arrangements we could make with local employers. For this reason we have inadequately represented women in management positions in Holland's Enterprising group and in his Realistic and Investigative clusters in general.

OIAS does not make use of audiovisual support materials. Instead, it refers students to persons in the community willing to talk with those who are interested in a particular occupation. The degree to which the OIAS project is able to give students a representative sample of both men and women in different occupations at different levels is contingent on the availability of women in these positions locally and their willingness to volunteer for this service. Obviously, the OIAS visitation program has the same potential for sex bias or fairness that the audiovisual aid support systems do. OIAS also offers students the opportunity to listen to audio cassettes of interviews with workers. The balance represented here also provides potential for sex bias or fairness.

ECES relies heavily on visual aids, since its entire occupational data file is presented in this fashion. This material could not be viewed in preparation for this paper. The writer recalls from having seen a demonstration some years ago, however, that the material made heavy use of cartooning in order to minimize sex bias, racial bias, and need for constant updating due to change in styles.

GIS and SIGI do not include any audiovisual materials.

SUPPORTING MATERIALS

CVIS provides as a part of its package a counselor manual, two student manuals (junior high and secondary level), an operator manual, a technical documentation manual, an informational brochure, and a 16mm color film entitled *Saturday's Child.* No evidence of sex bias was found in any of these materials.

OIAS provides a users handbook. The only evidence of sex bias found in this manual is in the section that describes the user's opportunity to visit local employees to talk about a given occupation:

> You may want to visit someone and talk to him about his line of work. He may also be able to show you where he works. He is doing this because he wants to, so you do not need to be nervous about contacting him.

The continuous use of *he/she* and *him/her* gets cumbersome in writing. However, the constant referral to the male gender in this quotation is an overuse of the generic pronoun and creates potential for influencing female students to limit the scope of occupations that they consider real options.

No evidence of sex bias was found in the GIS student study guide or in the ECES users guide.

SUMMARY

Relatively little was found in the material studied that indicates serious sex bias. The descriptive content of the data files, however, seems to have high potential for problems. The degree of sex bias or fairness that is present in interest inventories will have serious implications for the scope of a student's vocational exploration in systems that make use of such instruments to suggest or guide exploration. Supporting visual materials or community visitation programs can also be a source of subtle sex bias.

INFERENCES FROM RESEARCH ON EXISTING SYSTEMS

In the preceding section the available content of the components of computer-based guidance systems was analyzed. In this section we will attempt to make inferences about the use and effectiveness of computer-based systems for members of both sexes, based on the available research findings. Here the reader needs to be cautioned that the amount of research that has

been done on computer-based systems is relatively small; that existing research studies have not considered as a specific research question the comparative effectiveness of such systems for members of both sexes; and that the inferences that can be drawn have some statistical significance but may not have practical significance. On the basis of data from the research that has been done with CVIS and ECES, the following inferences can be drawn:

1. When allowed to use computer-based systems on a voluntary basis, male students use them slightly more than female students. According to CVIS data (Harris, 1972b), 50.5 percent of voluntary users of the system during 1969-70 were boys and 49.5 percent were girls. In 1970-71, 56.7 percent were boys and 43.3 percent were girls. ECES data (Thompson et al., 1970) indicate that the mean number of uses on a voluntary basis was 7.2 for male students as compared with 6.3 for female students during the field test conducted at Montclair (N.J.) High School.

2. Analysis of the responses of users of computer-based systems to evaluative questions about the system suggests that females respond somewhat more favorably to such systems than males. The overriding finding, however, is that all students respond very favorably to computer-based guidance systems; would much rather use them for career information than files, reference books, and other media, and often even prefer them to counselors; and easily learn to use them, with a minimum of supervision or assistance. However, slightly higher evaluation of such systems by females is illustrated in the following examples from the Montclair field trial of ECES (Thompson et al., 1970):

How helpful to you were the instructions and information you saw today on the *screen*?

	M	*F*
Very helpful	43	52
Fairly helpful	34	19
A little helpful	5	5
Not helpful at all	2	0
I did not use it today.	0	2
No response	1	0

How helpful to you were the instructions and information you saw today on the *typewriter*?

	M	*F*
Very helpful	53	57
Fairly helpful	21	13
A little helpful	7	6
Not helpful at all	1	0
I did not use it today.	1	
No response	2	0

How helpful to you were the instructions and information you saw today in the *booklet*?

	M	*F*
Very helpful	7	22
Fairly helpful	34	17
A little helpful	18	10
Not helpful at all	9	3
I did not use it today.	15	24
No response	2	2

3. Findings related to the relative effect of the use of computer-based systems on males and females show conflicting evidence, as illustrated here:

a. Melhus (1971) did not find sex to be a significant variable in the measurement of change in the crystallization of vocational plans as a result of the use of CVIS. Rank in class and ability were significant main effects, however.

b. Price (1971) did not find sex to be a significant main effect in comparing the effects of counselor registration and computer registration using CVIS. By all measures used, these two forms of registration seemed equally effective for both sexes and all quartiles.

c. Harris (1972b) found that the use of CVIS at sophomore level in high school does not increase the *number* of high-priority occupational options considered by either sex. Use of the system may, however, cause students to consider different occupations and in different priority order.

d. Harris (1972b) found that the use of CVIS at sophomore level in high school does not change the level of vocational-educational aspiration for either sex.

e. Harris (1972b) found that the use of CVIS causes a significant increase in the range and accuracy of information (knowledge of job duties, employment outlook, education required for

entry, working conditions) possessed about specific occupations explored at the terminal, but that this increase is greater for females ($p < .01$) than for males ($p < .05$). The same inference is borne out by data from the ECES Montclair field trial (Thompson et al., 1970).

f. When effects of the use of computer-based guidance systems are evaluated in terms of increase in vocational maturity, as measured by the pre- and postadministration of the Career Development Inventory (Super et al., 1971), it appears that use of computer-based systems causes gains in vocational maturity (Myers et al., 1972; Harris, 1972b) and that these gains are somewhat more significant for females than for males. The Career Development Inventory defines vocational maturity as awareness of need to plan (Scale A), knowledge and use of resources (Scale B), and information and decisionmaking (Scale C).

A general conclusion based on available research would be that computer-based systems serve both sexes equally well. Members of both sexes and their parents respond in an exceedingly positive way to receiving guidance information through this medium and prefer it to other media, reference materials, and even counselors. Members of both sexes indicate that use of computer-based systems brings a series of positive effects, including assistance with understanding interests and abilities and their relation to career choice, expansion of educational and occupational alternatives, increased knowledge about educational and occupational alternatives, and assistance with crystallization of career plans. Further, there is evidence (Melhus, 1971; Price, 1971) that certain functions, such as provision of occupational information for top-quartile students and registration for all students, can be performed as well by computer as by counselor for both sexes. Finally, there is evidence (Harris, 1972b; Myers et al., 1972) that use of computer-based systems results in increased vocational maturity for both sexes. There is some evidence that female students volunteer to use such systems slightly less, evaluate them slightly higher after use, and make slightly higher gains from their use.

It should be borne in mind that the development and use of computer-based guidance systems is still in its first decade. Developers are still dealing with technical problems and with gaining expertise in harnessing the medium for guidance purposes. Measuring sticks used in evaluation, such as instruments of vocational maturity and assessments of career-planning skills, are crude. For these reasons, present evaluative findings should be considered tentative. There is need for further refinement of systems, refinement of evaluative instruments and techniques, and further research aimed directly at questions of sex bias and fairness.

COST CONSIDERATIONS IN MODIFICATION OF EXISTING SYSTEMS

What would it cost to modify existing computer-based systems to free them of sex bias? The writer cannot place a dollar figure without a comprehensive knowledge of each of the existing systems from both a guidance and a technical viewpoint. However, a general statement can be made that the cost of modification of current systems to eliminate any evidence of sex bias would be quite small. This statement is based on two premises: (1) the amount of sex bias that has been found is small, and (2) the cost of updating computer-based systems is relatively small. The cost of updating will also depend on the system's capabilities and on the parts of it that need modification. For example, the cost of updating or change if the system has on-line updating capabilities will be less than if all updating must be accomplished by punched-card input. In the first case, primary cost factors would be (1) the time of the guidance person in analysis of the system and decisionmaking about necessary changes and (2) the time of a clerical person who makes such changes by modifying text and data files at the terminal. In the second case, primary cost factors would be (1) the time of the guidance person in analysis and decisionmaking, (2) the time of a keypunch operator, and (3) the time of a programer or systems analyst to do whatever programing is necessary to effect the changes or to select existing programs to effect the changes.

Another highly relevant question bearing on the cost of modification is: Where is modification necessary? The cost of modification of text and data files (assuming that appropriate data are already existent) is relatively low. The cost of modification of printed materials and the computer program itself would be higher. Modification of film images, filmstrips, and video tapes would be the most expensive.

OUTLOOK

This paper has summarized the current state of the art of the use of computers to assist young people with the collection and synthesis of information in preparation for career decisionmaking. The writer proposes that the use of computers in career guidance will become an increasing trend in this decade of emphasis on accountability, construction of systematic delivery models, and career education. In the opinion of the writer, the development of computer-based systems will be characterized by the following within the next decade:

1. Computer-based systems will be used to assist with long-term career development of individuals from at least middle school through adulthood. These systems will have all of the information-storing, -retrieving, -sorting, and -synthesizing functions characteristic of present systems; in addition, such systems will assist users with value clarification, learning and practice of decisionmaking skills, forging of individualized career patterns, and relation of occupational choice to lifestyle.
2. Computer-based systems will be used in a greater variety of settings. Schools will continue to be the heaviest users, and in this setting the system will be supported and enhanced by a planned program of curricular, guidance, and community activities. Computer-based systems will also be increasingly used as stand-alone systems in such settings as libraries, shopping malls, rehabilitation centers, state employment agencies, and prisons.
3. In schools, computer-based guidance systems will be nested in more comprehensive educational data-processing systems, which will serve the school for computer-assisted instruction and administrative purposes as well.
4. Computer-based guidance systems will become more cost feasible as the cost of computer equipment continues to decline.
5. Increasing use will be made of testing instruments, both on line and off line, in conjunction with computer-based systems. These will include interest inventories (among them the relatively new Holland Self-Directed Search and the Ohio Vocational Interest Survey); aptitude tests that relate to occupational choice (such as the American College Testing Program's Career Planning Profile, the Educational Testing Service's Comparative Guidance and Placement Test, and the Psychological Corporation's new interpretation of the Differential Aptitude Test); and measures of vocational maturity (such as Crites' Career Maturity Inventory, Super's Career Development Inventory, and the American College Testing Program's Assessment of Career Development).
6. Computer-based systems will make increasing use of audio, visual, and graphic material in conjunction with interactive dialog and verbal data files as the technology required to control these specialized devices decreases in cost and complexity.
7. There will be an increasing attempt to use local manpower data as input to computer-based systems so that the time lag between change in manpower needs and public knowledge of these changes can be shortened. Accompanying this trend will be an increasing use of computer-based systems to assist with the placement function.

INTERIM RECOMMENDATIONS

A minimal amount of sex bias has been found in computer-based guidance systems. The author does not feel, therefore, that existing systems need to be subjected to immediate overhaul. It is suggested that the following steps be taken:

1. The general guidelines that will be proposed by this committee should be broadly publicized to high school and community college counselors so that they can begin to be aware

of potential for sex bias in general and to take appropriate measures in dealing with students.

2. Developers and implementers of the computer-based systems described in this report should be made aware of its contents. They could be asked to consider revisions, wherever warranted, in the following ways and in the order indicated:

a. Files
   1) Computer-stored files, including text files, descriptions of occupations, local jobs, financial aids, colleges, and military programs
   2) Printed material, including preprinted occupational descriptions, counselor manuals, and student manuals
   3) Audiovisual materials used for orientation to the system or in conjunction with its use
b. System structure
   1) The design of the interrelationship of the components of the system
   2) The computer programs themselves

3. Guidelines suggested in this paper should be disseminated to the developers and potential developers of new computer-based guidance systems.

LONG-RANGE RECOMMENDATIONS

Further research and development is suggested to answer the following questions:

1. In what ways can computer systems be used to help a student monitor his or her own sex bias and to broaden options? This will require an examination of options as well as design and testing of possibilities such as pointing out that a user is consistently asking about occupations predominantly filled by women.
2. Which functions of the total career-guidance process can best be handled by *(a)* the computer system? *(b)* the counselor? *(c)* audiovisual and other media? What is their appropriate mix, given current technology? What is the relative cost effectiveness of various mixes?
3. What is the effect of language, sex-stereotyped titles, and information on users? What is the effect of describing labor-market biases in various ways? This issue can be addressed by examining the information-seeking behavior of users of sex-neutral as opposed to sex-linked information.
4. How can a system of communication between the Department of Labor and career-guidance systems best be developed so that current data on the sex mix of employment in various occupations can be disseminated quickly?
5. In what ways can computer systems assist with career development at the elementary age level? Can they combat the usual socialization process in younger children to avoid sex stereotyping?
6. Is the computer an effective device for the adult population, especially reentry persons and individuals who feel trapped in their present occupations? The special needs of men and women should be examined separately.
7. In what ways can computer systems be used to broaden options for all students—and at what optimal ages? Further research on the effects of present systems in broadening options is needed.
8. What are the differences, if any, in the effects of interest inventories administered and interpreted at a computer terminal as compared with traditional means? How effective is pre- and postadministration information-giving about interest inventories?

Given the concomitant development of more sophisticated computer-based guidance systems and of equal opportunities for both sexes, action also needs to be taken to insure that future computer-based guidance systems meet the needs and requirements of the new equality. Therefore the following recommendations are made in regard to future systems:

1. Since future systems will emphasize career development and career patterns, such systems should give attention to information and planning that help users understand alternate career patterns they may choose. For example, attention should be given to increasing awareness in individuals that they have an open choice of occupations and that career with or without marriage is an acceptable option for women; to planning for reentry into the job market after childbearing or after raising a

family; to attainment of skills for initial entry into the job market in the period of life that for others would be a period of maintenance of career; to adjustment to varying life roles at various stages in life; and to value clarification and decisionmaking in relation to career, marriage, and childbearing. Such concepts might be presented through biographical sketches or through simulation and game techniques.

2. Since computer-based systems will be used in a greater variety of settings with individuals of a much wider age span, attention should be given to making such systems maximally available. In addition to schools, computer-based systems should be available in libraries and shopping malls and in the home via the telephone and television. Additional research is needed to assess needs, desirable equipment configurations, use patterns, and cost effectiveness.

3. To the extent that computer-based systems make use of testing instruments, continuing attention should be given to the development of sex-fair measures of vocational interest, aptitude, and maturity.

4. Since visual materials will become a cost-feasible component of computer-based systems, attention should be given to the development of guidelines for the presentation of occupational information through films, filmstrips, video cassettes, and tape recordings in such a way that present sex stereotypes about roles and latitude or level of vocational choice can be dissolved. Such guidelines would suggest that men and women be equally represented with an even spread of each over the varying fields and levels of occupational endeavor.

5. Since computer-based systems will make increasing use of labor-market data both for informational purposes and for job placement, continuing attention should be given to the collection and synthesis of data about the number and position of both men and women in the work force. Coordination is needed at the Federal level to identify the kind of labor-market data needed and to find channels for the transmission of *current* data to computer-based systems in machine-readable form.

6. Future systems should be developed in keeping with guidelines implied in this paper. These guidelines include the following:

a. In the writing of interactive dialog, great care should be taken to make the text as sex-fair as possible. This can be accomplished by—

1) Using both pronouns *he* and *she*, the plural *they*, or generic terms such as *individuals* and *persons*.

2) Using unisex occupations as examples wherever possible. When this is not possible, there should be a balance of men and women in occupations in different fields and at different levels that do not reinforce stereotypes.

3) Writing simulation problems that pose decisionmaking situations for both sexes in equal number, scope, and complexity.

b. In the construction of data files about occupations, great care should be taken to present all occupations as options to members of both sexes. This can be accomplished by—

1) Making all ocupational titles in the file as sexless as possible or, where necessary, using double titles.

2) Presenting factual information about job duties, skill and training requirements, working conditions, benefits and limitations, and psychosocial factors of occupations without reference to the appropriateness of an occupation for men or women.

3) Providing accurate, updated information about the proportions of the sexes in individual occupations. Users will thus be accurately informed about the current status of men and women in various occupations so that they can assess their own situations and make personal decisions.

4) Showing three categories of descriptive status for occupations that have been sex stereotyped in the past:

a) Occupations in which there is a significant trend toward opening for members of the other sex.

b) Occupations in which there are no performance limitations that should exclude members of the other sex. System users should feel free to enter these occupations but should recognize that they would be in a minority position.

c) Occupations for which there are some kinds of requirements that hinder the entry of members of one sex. Sources of help are

cited for those who wish to take high risk and an advocacy position.

c. Computer programs should (1) be written in such a way that no occupations are eliminated from exploration on the basis of the user's sex, (2) include strategies to encourage and help users to broaden their options, and (3) provide an optional module on new frontiers for women.

d. If measures of vocational interest, vocational aptitude, or vocational maturity are used in conjunction with a computer-based system, either off or on line, a careful check of these instruments should be made to determine whether the manner in which the tests are used, the methods of norming, or the test items themselves reflect sex bias.

e. Audiovisual materials used in conjunction with computer-based guidance systems should reflect sex fairness by representing both men and women in all fields and levels of occupational endeavor so as not to imply any systematic sex bias.

f. The supporting materials used in conjunction with computer-based guidance systems should reflect sex fairness by representing equality of occupational choice in the content of the verbal material, the pictures shown, and the instructions given for use of the system components.

It is important to note that what happens at a computer terminal is an interaction of the content of the system itself and the perception of the user. The guidelines proposed here hopefully will minimize the possibility of sex bias in the design and content of the system; they can do nothing to change the self-concept that the user bring to the terminal.

It is recommended that these guidelines be presented to the Publication Committee of the National Vocational Guidance Association for inclusion in the next printing of *Tested Practices: Computer-Assisted Guidance Systems* (Harris, 1972a).

CONCLUSIONS

In conclusion, the author proposes that the computer is potentially a very powerful delivery system for sex-fair career information and guidance. Given the application of the guidelines proposed, the computer system will deliver equal information and treatment to all students who sit at its terminals regardless of sex, race, color, or disadvantage. The computer is a totally impartial and objective tool. It is devoid of all the nonverbal cues that characterize human communication. Yet, in spite of this objectivity, it is viewed by students as personal if it stores and uses personal data about users. Some of the less formal evaluation of CVIS indicates that students feel counselors have preconceived notions about which occupations are appropriate for them to enter, and that they will not discuss with their counselors occupations that they perceive to be unacceptable to the counselors. On the other hand, they feel the computer is completely objective, producing the same list of occupations for all students who enter the same characteristics into the system and producing, without comment, information about any occupation requested. In addition, it allows them to explore as many different occupations as they wish, some of very little or marginal interest to them, with a "What if . . . ?" kind of attitude and a minimum of commitment. Although printed resource material can provide the same advantages, the computer system both allows the consideration of personal data in the exploration process and has a much higher interest and motivation factor for students.

These capabilities allow users of computer-based systems to receive a vast quantity of nonbiased information with which to exercise freedom of personal choice and decision. Computer-based systems can provide great assistance with nonbiased delivery of information about occupational choice for individuals of all ages. The early conditioning of girls about their role in society and the willingness of society in general to accept women in new roles will depend on the impact of other forces.

REFERENCES

Harris, J. E. *Toward guidelines for computer involvement in guidance.* Washington: National Vocational Guidance Association, 1971.

Harris, J. E. *Tested practices: Computer-assisted guidance systems.* Washington: National Vocational Guidance Association, 1972. (a)

Harris, J. E. Analysis of the effects of a computer-based vocational information system on selected aspects of vocational planning. Unpublished doctoral disertation, Northern Illinois University, 1972. (b)

Harris, J. E., and Super, D. E. The computer: Guidance tool of the future. In E. Coffman (Ed.), *Frontiers of educational measurement and information systems.* Boston: Houghton Mifflin, 1973.

Havens, R. I. (Ed.). Technology in guidance. Special issue of *Personnel and Guidance Journal,* 1970, 49(3).

Kroll, A. Computer-based systems for career guidance and information: A status report. (Mimeographed) Also published in *Focus on Guidance,* March 1973.

Melhus, G. E. Computer-assisted vocational choice compared with traditional vocational counseling. Unpublished doctoral dissertation, Illinois Institute of Technology, 1971.

Myers, R. A., Lindeman, R. H., Forrest, D. J., and Super, D. E. *Preliminary report; Assessment of the first year of use of the educational and career exploration system in secondary schools of Genesee County, Michigan.* New York: Teachers College Press, Columbia University, 1971.

Myers, R. A., et al. *Educational and career exploration system: Report of a two-year field trial.* New York: Teachers College Press, Columbia University, 1972.

Price, G. E. A comparison of computer and counselor effectiveness in assisting high school students explore and select courses. Unpublished doctoral dissertation, Michigan State University, 1971.

Roe, A. *The psychology of occupations.* New York: Wiley, 1956.

Rosser, D. S. What you should know about new computer-based college selection services. *Nation's Schools,* 1969, 84, 5.

Super, D. E. (Ed.). *Computer-assisted counseling.* New York: Teachers College Press, Columbia University, 1970.

Weinstein, J. (Ed.). *Computer-based vocational guidance systems.* (Report of U.S. Department of Health, Education, and Welfare) Washington: Government Printing Office (Catalog No. 5225:25053), 1969.

MATERIAL READ ABOUT THE PROJECTS

COMPUTERIZED VOCATIONAL INFORMATION SYSTEM (CVIS)

CVIS: A futuristic concept of educational and vocational decision making; counselor manual; student manuals; all interactive dialogs; all occupational briefs

Super, D. E., et al. Career Development Inventory, Form I. New York: Teachers College Press, Columbia University, 1971.

Thompson, A. S., et al. *The educational and career exploration system: Field trial and evaluation in Montclair High School.* New York: Teachers College Press, Columbia University, 1970.

EDUCATION AND CAREER EXPLORATION SYSTEM (ECES)

Users guide; Career Decision-Making Program; examples of charts; samples of dialog

GUIDANCE INFORMATION SYSTEM (GIS)

Student study guide

OCCUPATIONAL INFORMATION ACCESS SYSTEM (OIAS)

Career Information System; Computerized Occupational Information System; users handbook; sample occupational briefs and interactive dialog

SYSTEM FOR INTERACTIVE GUIDANCE AND INFORMATION (SIGI)

Katz, M., Chapman, W., and Godwin, W. SIGI: A computer-based aid to career decision-making. *EDUCOM Bulletin,* Summer 1972.

Katz, M., Norris, L., and Chapman, W. *SIGI: Report of a pilot study under field conditions.* Princeton, N.J.: Educational Testing Service, 1973.

The Legal Implications of Sex Bias in Interest Inventories

/11

Laurine E. Fitzgerald
UNIVERSITY OF WISCONSIN—OSHKOSH
assisted by
B. Jeanne Fisher
LEGAL RESEARCH ASSISTANT

ABSTRACT

Nearly a decade after the landmark Civil Rights Act (1964), which has since engendered increasingly specific laws encompassing discrimination and bias based on sex, no test case has considered or noted interest measurement instruments. By application of the *doctrine of analogy*, inferences regarding the legal issues of interest measurement in education and employment have been drawn from relevant court decisions, from guidelines implementing laws, and from statements on test bias issued by national professional organizations and measurement specialists.

To the extent that interest inventories support stereotypic sex and occupational linkages or restrictions, the tests are biased. Disparate scales on sex-distinct forms of a test, normative procedures that might predictably produce distinctly

different scores on account of sex, and misuse of interest scores in educational and employment decisionmaking are examples of potential legal issues related to interest measurement. Specifically, should a sex-biased interest inventory be instrumental in discouraging an applicant for educational or employment opportunity or be used in a negative decision in the case of the applicant because of differentiating scales or inappropriate sex-biased normative data, then it would appear that the *spirit of the law* is denied.

State and Federal guidelines adopted since the enactment of the Cvil Rights Act (1964) and its amendments have tended to incorporate and reflect many of the same provisions and definitions of terms relating to testing and occupational/educational interests. Generally these guidelines have been nonspecific regarding interest measurement, and inferential opinion has not led to judicial action. Two remedies seem clearly indicated: (1) Existing guidelines supporting law should be revised for greater specificity regarding the use of interest inventories and the educational or employment applicant's stake in the decisionmaking process, and more specific guidelines should be developed to support Title IX of the Education Amendments of 1972. (2) The law related to discrimination and bias should definitively state the dimensions of concern in order to assure judicial decisions that more closely correspond to the *spirit of the law.*

225

INTRODUCTION

The purpose of this paper is to provide information about legal issues relating to sex bias that may be inherent in the present popular usage of standardized interest measurement instruments. The focus is on current laws, guidelines, and regulations and the possible implications of judicial decisions that relate to sex bias and interest measurement in education and employment settings.

At the outset it must be noted that there are no recorded judicial decisions that directly challenge or affirm the use of interest measurement instruments in educational institutions or by employers. Legal precedent has been established, however, in the case of intelligence testing in public education and employment. It can be assumed that the use of interest inventories and the question of possible sex bias in these instruments will become a matter of judicial record following the pattern of related issues and resultant legal action.

THE PROCESS OF LAW

Legislative acts and laws are important tools in the process of law. Law, however, is much more dynamic than a set of rules and regulations; it should be studied as a social institution.

> Law is an institution in the sense of an integrated pattern or process of social behaviors and ideas. What goes on inside courts, legislatures, law offices, and other places in which law-making, law-enforcing, law-administering, and law-interpreting is carried on, together with what goes on inside the minds of people thinking with reference to what goes on in these places, forms a law way of acting and thinking, which overlaps but is not identical with economic, religious, political and other social ways of acting and thinking [Berman & Greiner, 1972, pp. 6-7].

Law embodies the moral and economic principles of the society, reflects the political authorities who shape it, and represents the historical continuity and consistency of doctrine. The Constitution and State and Federal laws help define the parameters of acceptable conduct and enable people to calculate the legal consequences of their conduct. The broad and general nature of the Constitution and the various laws presents the problem of interpretation of meaning and intent. Every judicial decision adds to the body of knowledge that defines what the law is. Judicial opinions also interpret the legislative intent in enacting the law.

Legal reasoning involves viewing a particular situation in the light of past legal decisions. One must ask: Has there been a similar situation in the past? What were the legal questions involved? What were the facts of the case? What was the decision? Was this a fair treatment of the law? Has there been any change in the decision as a result of legislation? If there have been no similar situations in the past, have there been any analogous situations? If not, is there any legislation that may be applicable? What is the intent, meaning, and scope of such legislation?

Each court case is concerned with a particular set of facts and circumstances on which a decision is based. The fact situation is carefully analyzed and a search is made for similar situations in the past. The bases for the decisions in previous cases are analyzed. In this process the judge may discern a similar pattern or may find that the view of the court has changed, either because of a change in moral, political, or economic views of the community or because of legislative acts.

The decision in each court case embodies a narrow view of the law. As new cases are decided, involving slightly different facts and circumstances, the view of the law is broadened. However, this broadened view does not mean a change in the *direction* of the law. For a change in the direction of the law there must be a change in the legislative act on which it is based. The broadening or developing of the law involves interpreting or reinterpreting the *intent, purpose,* and *scope* of legislative acts, which may lead to the discovery of new meaning in such legislation. This usually involves a long period of time.

To understand the meaning of a particular section of a legislative act, one must study successive cases that closely resemble each other. The similarities and differences between the facts and circumstances of the cases must be studied in order to understand the precedents involved.

A court can also reason by analogy by considering the similarities between two situations, where one of the two situations is covered by a statutory provision. If the similarities between the two situations outweigh the dissimilarities, the court can say that the statutory provision applies to both situations.

Sometimes, when the dissimilarities are so great that we cannot fairly say that the similarities outweigh the dissimilarities, the court will still apply the statutory provision applicable to the one situation by invoking the *spirit of the law*: we refer to this method as the *doctrine of analogy* [Zwarensteyn, 1968, p. 74].

This paper will review the *Griggs* v. *Duke Power Co.* case, 401 U.S. 424 (1971), other related court decisions, and those which set precedents relating to sex classification and the 5th and 14th amendments to the Constitution; will include an assessment of the meaning of State and Federal law, regulations, and guidelines pertaining to affirmative action and equal employment opportunity; and will note the involvement of professional associations in the matter of sex bias in interest inventories. The doctrine of analogy will be employed to relate an opinion of the foregoing to the use of standardized interest measures.

RELATED JUDICIAL REVIEW

Griggs v. *Duke Power Co.* is the most important case dealing with testing and employment procedures. The U.S. Supreme Court held in that case that the requirement of a high school education or a minimum score on a standardized general intelligence test is an impermissible condition of employment or transfer of jobs where neither standard is shown to be significantly related to successful job performance and where there is a disparate effect on a protected class or group.

The Court was principally concerned with three interrelated considerations: (1) congressional objectives in passing Title VII of the Civil Rights Act of 1964, (2) Equal Employment Opportunity Commission (EEOC) guidelines and interpretations, and (3) congressional intent as to section 703(h) of Title VII specifically.

The Duke Power Company's Dan River steam station was organized into five operating departments: (1) labor, (2) coal handling, (3) operations, (4) maintenance, and (5) laboratory and test. The district court found that prior to July 2, 1965 (the effective date of the Civil Rights Act of 1964), the respondent "openly discriminated on the basis of race in hiring and assigning of employees" at its Dan River plant. "Negroes were traditionally engaged only in the Labor Department where the highest paying jobs paid less than the lowest paying jobs in the other departments [*Griggs* v. *Duke Power Co.*, p. 427]."

The *Griggs* case states the Supreme Court interpretation of what is required of employers under Title VII of the 1964 Civil Rights Act. Good intent or absence of discriminatory intent does not redeem employment procedures or testing mechanisms that operate as "built-in headwinds" for minority groups and are unrelated to measuring job capability. Tests must measure the person in relation to the job and not the person in the abstract. The case determined that for a test to be valid it must be related to a particular type of job. The power company contended that it was within the law in using the professionally developed intelligence test because section 703(h) of the 1964 Civil Rights Act authorized the use of "any professionally developed ability test" that is not "designed, intended, or used to discriminate because of race, color, religion, sex, or national origin." However, the EEOC, which has the responsibility of enforcing the act, has issued guidelines that permit only the use of job-related tests. The fact that a test has been professionally developed is no defense; if it can be shown to discriminate against a protected class (e.g., race or sex), then it should be found to be illegal.

"It seems from this holding [*Griggs*] that the courts will look mainly at whether the employment test in question has an adequate business necessity. They will look to see whether the skills measured by the test are comparable to those required by the job, and whether there is a fairly high correlation between the score a person gets and his [*sic*] actual performance on the job. If these things are satisfied, then it seems that whether the test was constructed by a person with professional credentials or not wouldn't make too much difference [Northcross, 1973]."

Revised Order No. 4, which implements Executive Order No. 11246, as amended (U.S. Department of Labor, 1971a), sets forth the concept and implementations of affirmative action programs. Affirmative action programs are aimed at, among other things, eliminating discriminatory barriers to equal employment opportunity. Patterns of systematic discriminations have been so pervasive in the culture that there has been an enormous underutilization of human talent. Employment and promotion policies, whether based on state protective legislation or "common practice" and stereotypic thinking, have contributed to systematic underutilization. Within the concept of affirmative action, once a pattern of underutilization is identified, the next steps are to assess the obstacles that have produced it and then to design corrective measures.

In his partial dissent to the majority decision of the U.S. Court of Appeals for the Fourth District in the *Griggs* case, Judge Simon E. Sobeloff noted the "freezing" of an entire population of Negro employees into the discriminatory patterns that existed before the Civil Rights Act. Sexually biased interest inventories *could* have the similar effect of freezing women into thinking about and perhaps being counseled toward only certain job classifications and careers.

The courts have strictly scrutinized cases involving "suspect classifications." The state bears the burden of establishing that it has a *compelling* interest that justifies the law and that the distinctions of the classifications within the law are *necessary* to the purpose of the law. The characteristic of a "suspect classification" is that it bears no relation to the ability to perform or to contribute to society. "Where the relation between characteristic and evil to be prevented is so tenuous, courts must look closely at classifications based on that characteristic, lest outdated social stereotypes result in invidious laws or practices [Kanowitz, 1973, p. 507]."

Interest inventories are usually administered to answer the basic question: "Should an individual consider, train for, or enter a specific occupation? [Harmon, 1973]." If an interest inventory is or can be used to encourage a person to enter or to reject an occupation, in part or in whole, on the basis of sex, then the interest instrument is biased. Interest instruments are limited in the number of options they offer. Additionally, they may have been normed in a sexually stereotypic manner and have two test forms with different occupational scales, each based on responses from one sex.

> The occupational scales available on the Kuder DD, the SVIB TW398 for women, the SVIB T399 for men, and the MVII are examples of sexual stereotypes in the world of work. These are the best of the interest inventories, yet they tend to perpetuate the idea that sex and occupational choice are inherently related. They suggest that there are some occupations (architect, electrician, production manager, life insurance salesperson) which women should not enter and some occupations which men should not consider (elementary teaching, nursing, secretarial work) [Harmon, 1973, pp. 449-500].

[*Editor's note:* Scores on all scales have since become available routinely on the Kuder DD, and a unisex form of the SVIB—the Strong-Campbell Interest Inventory, which reports scores on all scales—is available in addition to the SVIB men's and women's blanks.]

Consideration of bias or discrimination stemming from the use of interest inventories employing separate but equitable scales, normed on populations differentiated by sex, does not appear to be within the scope, intent, or spirit of existing law. The current practice of reporting scores to individuals of one sex that have been developed for the other sex is questionable counseling or employment practice and *not* mandated by law. From the decision in *Hobson* v. *Hansen*, 269 F. Supp. 401 (1967), in regard to ability testing, a crucial assumption is that the individual is fairly comparable with the norming group in terms of environmental background and psychological makeup; to the extent that there are differences between the individual and the norming group, the test score may reflect those differences rather than innate differences.

Reed v. *Reed*, 404 U.S. 71, 92 S. Ct. 251, 30 L. Ed. 2d 225 (1971), was the first U.S. Supreme Court decision to strike down a sex-based discriminatory classification because it was found to violate the equal protection clause of the 14th amendment. The Court found that in order to be legal the classification must be reasonable and must bear a rational relation to the stated objective sought to be advanced by the statute.

The classification in the *Reed* case was drawn solely on the basis of sex.

In *Frontiero* v. *Laird,* 341 F. Supp. 201 (U.S. Dist. Ala., 1972), the court found that the classification on the whole was not based on sex and that there was a rational basis for the different treatment accorded the sexes. Therefore the court concluded that the challenged statutes were not in conflict with the due process clause of the fifth amendment.

The *Griggs* and *Hobson* cases set the legal precedent for the use of interest and ability tests in employment practices. The Civil Rights Act (1964), Revised Order No. 4, and Executive Order No. 11246, as amended, are intended to eliminate all forms of discrimination against minorities and women. As earlier noted, a court can reason by analogy by considering the similarities between two situations when there is statutory provision for only one of the situations. Accordingly, the use of sex-biased interest inventories is contrary to the spirit of the law and should be found to be illegal in a court of law.

STATE LAWS AFFECTING EMPLOYEE SELECTION

Topic law reports are not available for the areas of counseling or the more general topic of education; "testing of workers," however, is included in the Commerce Clearinghouse report *Employment Practices Guide* (1973). The following States have enacted laws regulating the use of preemployment tests by employers (the numbers refer to paragraph numbers in the Commerce Clearinghouse report): Arizona (20,495), California (20,860), Colorado (21,060), Iowa (22,880), Maryland (23,850), and Pennsylvania (27,250).

An examination of the wording of these laws shows careful adherence to the language of the 1964 Civil Rights Act. For example, a comparison of the U.S. Equal Employment Opportunity Coordinating Council (EEOCC) uniform guidelines on employee selection procedures (1973) with the language of the State of Iowa employee selection procedures shows great similarity. It is interesting to note that in rules defining a test, both employ the words "used as a basis for any *employment decision*"; both also include "occupational or other interests" in the definition. The EEOCC guidelines govern all employers with 15 or more employees, whereas State laws cover only employers based within the State.

Although these guidelines are specifically provided for employers, to be followed in employee selection procedures, it would seem to be within the intent and spirit of the law that "employment decision" and "occupational and other interests" must take into consideration those factors which inhibit free choice on the part of the prospective employee. Thus a procedure or requirement utilizing an interest inventory with limited (compared with those available for the opposite sex) or biased employment/occupational scales and obtaining the test results by means of a printed format, with or without consultative interpretation, could be included as a part of an employment decision jointly made by the employer *and* the employee.

A review of the 13 laws in 11 States that concern prehiring inquiries was nonproductive relative to interest measurement.

Although individual State laws may be comprehensive and conform to the intent of affirmative action legislation at the Federal level, it seems apparent that not all States will follow suit. Comprehensive Federal legislation or Supreme Court interpretation of existing legislation directed to interest measurement is preferable to 50 State laws on the subject.

NATIONAL LAWS, REGULATIONS, AND GUIDELINES

Title VII of the 1964 Civil Rights Act, as amended, states that it is an unlawful employment practice for an employer to limit, segregate, or classify employees in any way that would deprive or tend to deprive them of employment opportunities, or otherwise adversely affect their status as employees, because of race, color, religion, sex, or national origin. Prior to the 1972 amendments, and after adoption of the Civil Rights Act, the Illinois Fair Employment Practice Commission held, in *Myart* v. *Motorola, Inc.,* 1190 Cong. Rec. 7213 (1964),

that even though the ability test in question had been professionally developed, it could not be used in employment decisions because it had not been revised to meet the needs of the culturally deprived.

The spirit of the law, as interpreted by the courts, indicates that the use of any test in the *employment decision process* (in the broadest sense of the practice) must not in any way deny equality of employment opportunity. A test having been ruled inappropriate for use in employment decisions because it had not been revised to meet the needs of the culturally deprived, inferentially it *may* be held that interest inventories that limit the individual because of options provided on the basis of sex, or that require interpretation of normed scales inappropriate on the basis of sex, are also inappropriate for use in employee selection.

Title IX of the Education Amendments of 1972, section 901(a), prohibits, on the basis of sex, exclusion from participating in, denial of the benefits of, or individual subjections to discrimination under *any educational program or activity* receiving Federal financial assistance. Unlike Title VII and Executive Order No. 11246, as amended, the 1972 Education Amendments (specifically Title IX) apply to *both* students and employees. A memorandum to presidents of institutions of higher education participating in Federal assistance programs stated that "as a condition of receiving Federal assistance, your institution must make all benefits and services available to students without discrimination on the basis of sex [Pottinger, 1972]." To the extent that sexually stereotypic interest inventories are held to be discriminatory when used in the decisionmaking, guidance or counseling, or occupational/vocational information dissemination process of education, then use of certain interest measures now commonly employed in secondary and postsecondary education is illegal.

The Congress of the United States has left to the EEOC and to the courts the responsibility of determining what specific practices constitute race and sex discrimination in employment. Congressional action indicates little effort to list or otherwise specify or determine the precise conduct that would be iliegal under the 1964 Civil Rights Act or Title IX of the Education Amendments of 1972. Courts must therefore base their judgments on the broad policies of these laws. The resultant development resembles a common law of unfair employment practices.

Additionally, courts are not bound by regulations issued by the EEOC *(Grimm* v. *Westinghouse Electric Corp.,* 300 F. Supp. 984, 988-989 [N.D. Cal. 1969]), and judicial challenges to resolve issues of test validation have been complicated by the failure of many courts to demand strict compliance with guidelines in Title VII litigation. Chief Justice Warren E. Burger, in delivering the majority opinion in the *Griggs* case, stated that the administrative interpretation of Title VII of the 1964 Civil Rights Act by the EEOC, the enforcing agency, "is entitled to great deference . . . . Since the Act and its legislative history support the Commission's construction, this affords good reason to treat the Guidelines as expressing the will of Congress *[Griggs* v. *Duke Power Co.,* p. 855]." Public employees were initially exempt from Title VII. The Equal Employment Opportunity Act of 1972 expanded the coverage of Title VII to include State and local governments and their employees. It seems essential that courts adopt the clear format presented by the EEOCC guidelines on employee selection procedures to resolve the critical issues involved in employment testing.

The Office of Federal Contract Compliance guidelines require employers using tests to have data available demonstrating that the test is predictive of or significantly correlated with important elements of work behavior that constitute or are relevant to the job for which the candidates are being evaluated. These regulations concerning employee testing and other selection procedures (U.S. Department of Labor, 1971b) specifically state: "Under no circumstances will the general reputation of a test, its author or its publisher, or casual reports of test utility be accepted in lieu of validity." A testing program must be found to be of significant help in predicting prospective employees' performance on the job in question. Inferentially, an interest test that delimits options, does not include areas of potential employment provided by the administering organization, or has clear sex-related but unequal options on properly normed scales, could not be administered.

ACTIVITIES OF THE PROFESSIONAL ASSOCIATIONS

The awareness and involvement of professional associations in expressed concern for affirmative action in regard to interest testing—to some extent, testing in general—has been disappointing. Initiative on the part of organizations has been taken only after concerned numbers focused on the issue. In connection with the Omnibus Post-Secondary Education Act hearings (U.S. Congress, House, 1970), Fitzgerald noted the discriminatory nature of a prominent interest inventory, resulting from vastly different norming and occupational options indicated on the basis of sex. Pursuing this same point, Schlossberg and Goodman submitted a resolution to the American Personnel and Guidance Association for consideration at the annual meeting in Chicago, March 1972. The strongly worded resolution was referred to a division of the APGA, the Association for Measurement and Evaluation in Guidance (AMEG), which then formed the AMEG Commission on Sex Bias in Measurement to deal with this and related issues. The commission published its findings in a report of October 1973 (AMEG, 1973). A major outcome of the report is the recommendation of a permanent committee on sex bias in measurement "charged with contacting test publishers and offering the services of specialized teams of AMEG members to help assess sexual bias in specific instruments."

The National Association for Women Deans, Administrators, and Counselors endorsed a "Statement on Primary and Secondary Education for Girls and Their Mentors" *(NAWDC Pre-Convention Exchange '73)* in April 1973 at the time of the annual conference of that association. The document is concerned with sexism as may be evidenced in admissions, curriculums, teachers and counselors, class and extraclass activities, health, and advising and counseling. In the section on advising and counseling two specific references to interest inventories are made:

> 6. Vocational and psychological tests as well as vocational advice should be without sex bias.
> 7. As career interests among girls take shape by about the age of fourteen, high school girls should be given some indication of the strength of their career motivation through interest inventories. Existing tests available for girls are based on the assumption that girls have the same life patterns as boys. Separate normative data on interest inventories should be developed for girls . . . [p. 10].

Further indication of the concerns of this association was evidenced in the implementation statements passed by the membership in support of "1973 Convention Resolution No. 1" *(NAWDC Post-Convention Exchange '73):*

> 1. Encourage cooperation with other organizations to develop career counseling materials for women students.
> 2. Encourage individual members to support research which will develop objective tools of evaluation for career aptitudes [p. 1].

Recommendations of the American Psychological Association ad hoc Committee on Women in Psychology are specific with respect to possible stereotyped concepts of masculinity and femininity in aptitude and personality tests, but *interest* measurement is *not* mentioned *(APA Monitor,* September-October 1973). Most "inherent test bias" concerns of the APA and other education organizations relate to racial or culture-fair testing or exclude, perhaps by default, the cluster of interest inventories when focusing on occupational-vocational references, resources, and tools.

Resolutions of guidance, counseling, and personnel associations such as the American College Personnel Association and the National Association of Student Personnel Administrators have supported equal employment opportunities, affirmative action programs, and nonsexist counseling tools, but have been nonspecific regarding the development, content, and use of unequal norming and scaling practices specific to measurement of interests.

Several professional organizations are directly concerned with writing legislation governing the licensing of practitioners at the State level, with lobbying for Federal funding of training programs for graduate professional education, and they may also establish curricular standards for postsecondary education for professional training. Among these groups are the American College Personnel Association, the Association for Counselor Education and Super-

vision, and the National Vocational Guidance Association, all of which are divisions of the American Personnel and Guidance Association, and Divisions 5, 12, 15, and 17 of the American Psychological Association, which focus on evaluation and measurement, clinical psychology, educational psychology, and counseling psychology. Since these organizations, together with others, have endorsed affirmative action programs, they should now address themselves to the development and use of nonsexist counseling tools, which would include interest inventories. They should require careful review of professional training programs and the elimination of textbooks and other resources, as well as existing curricular emphasis and practice, that delimit or otherwise discriminate against women as professionals or perpetuate stereotyped career opportunities for girls and women as clients or students.

RECOMMENDATIONS

Federal legislation of concern to this topic is broad in scope, but relatively unspecified. Interpretation of the legislation is implemented by Federal guidelines and by judicial review and decision in courts of law. The law is thus evolutionary in nature but frequently involves a great deal of time outside the judicial system for the development of guidelines. An example of time requirements is the more than 20-month period required to develop guidelines for Title IX of the Education Amendments of 1972.

In the development of legislative guidelines and, more directly, in the writing of statutory laws, greater specificity in supporting statements of intent and direction for the legislation is mandatory.

Evaluating sex bias in interest inventories for the development of future legislation or for the revision of guidelines under existing laws that affect interest measurement should involve the following considerations:

- Interest instruments utilizing a single or dual inventory format should be normed on the basis of populations that are comparable to the environmental, cultural, and psychological background of the test taker.
- In instruments with separate inventory forms on the basis of sex, the same vocational scales, clusterings, and occupational choices should be provided.
- In instruments with separate inventory forms on the basis of sex and with the same scales, the norming of the scales should be based on sex.
- The language used in the instrument should be nonsexist.
- Interest inventories used in employment decisions should be validated in a manner which clearly demonstrates a relation between scales and employment roles in the immediate work setting.
- Interest measurement in employment decisions should be supported by data indicating a direct relation between inventory scores and candidate performance in the positions available.
- The use of sex-biased interest inventories in the educational setting should be illegal.

Additional aspects of legislative concern relating to sex bias in interest measurement in employment and education settings include the following:

- Postsecondary institutions providing professional training programs for persons who will use interest inventories should offer a required curricular unit regarding sex bias in testing and in interest inventory construction and interpretation.
- Graduate student programs of study, workshops, conferences, and related programs sponsored by Federal funding should include training segments related to nonsexist interest assessment.
- The following steps might be taken by individuals and institutions during the transition period, which should be no longer than five years:

  1. Employers and institutions could review interest assessment instruments to determine compliance with the law, discontinuing the use of inventories clearly in violation because of sexist orientation of items, language, and other elements.

2. Professional organizations at Federal and State levels could initiate workshops, conferences, and studies on the development and use of nonsexist interest inventories.
3. Publishers of interest inventories could revise manuals and reference materials provided for individuals who purchase, administer, and interpret interest assessment instruments to insure that areas of potential sex bias (differentiated scaling by sex, normative populations, etc.) are noted.

- Federal legislation should be enacted that will provide for sufficient funding to develop nonsexist interest inventories and related vocational resources for all educational and employment levels.

The overriding consideration as to whether a *specific* interest inventory is or is not discriminatory will not rest solely on whether the above principles are adhered to, but will ultimately be determined by the use and application of the instrument. If the inventory structure has a demonstrated discriminatory effect on either sex, however, the use of the instrument should be considered illegal.

REFERENCES

APA Monitor, September-October 1973.

Association for Measurement and Evaluation in Guidance. AMEG commission report on sex bias in interest measurement. *Measurement and Evaluation in Guidance*, 1973, 6, 171-177.

Berman, H. H., & Greiner, W. R. *The Nature and Functions of Law*. Mineola, N.Y.: Foundation Press, 1972.

Employment Practices Guide. New York: Commerce Clearinghouse, 1973.

Executive Order No. 11246, 1965, as amended by Executive Order No. 11375, 1967.

Harmon, L. W. Sexual bias in interest measurement. *Measurement and Evaluation in Guidance*, 1973, 5, 496-501.

Kanowitz, L. *Sex roles in law and society*. Albuquerque: University of New Mexico Press, 1973.

NAWDC Pre-Convention Exchange '73. National Association for Women Deans, Administrators, and Counselors, June *(sic)* 1973.

NAWDC Post-Convention Exchange '73. National Association for Women Deans, Administrators, and Counselors, July 1973.

Northcross, W. The limits on employment testing. *Journal of Urban Law*, 1973, 50, 349-370.

Pottinger, S. Memorandum to presidents of institutions of higher education participating in Federal assistance programs. Department of Health, Education, and Welfare, Office of the Secretary, August 1972.

U.S. Congress. Public Law 88-352, Civil Rights Act. H.R. 7152, 88th Cong., July 2, 1964.

U.S. Congress. Public Law 92-318, Education Amendments of 1972. S. 659, 92d Cong., June 23, 1972. Title IX, Prohibition of sex discrimination.

U.S. Congress, House, Hearings before the Special Subcommittee on Education of the Committee on Education and Labor, House of Representatives, 91st Cong., 2d sess., June 1970, H.R. 16098, sec. 805. In *Omnibus postsecondary education action of 1970*, pt. I, 506-510. Washington: Government Printing Office, 1970.

U.S. Congress, House. D. M. Fraser, Title VII of the Civil Rights Act and sex discrimination in educational institutions. *Congressional Record*, May 9, 1972. Reprinted by Project on the Status and Education of Women, Association of American Colleges, Washington, D.C., 1972.

U.S. Department of Labor, Office of Federal Contract Compliance (Equal Employment Opportunity). Sex discrimination guidelines. *Public Contracts and Property Management*, Title 41, ch. 60, pt. 60-2. *Federal Register*, 1970, 35(111).

U.S. Department of Labor, Office of Federal Contract Compliance (Equal Employment Opportunity). Affirmative action programs (Revised Order No. 4). *Public Contracts and Property Management*, Title 41, ch. 60, pt. 60-2. *Federal Register*, 1971, 36(234). (a)

U.S. Department of Labor, Office of Federal Contract Compliance (Equal Employment Opportunity). Employer testing and other selection procedures. *Public Contracts and Property Management*, Title 41, ch. 60, pt. 60-3. *Federal Register*, 1971, 36(192). (b)

U.S. Equal Employment Opportunity Coordinating Council (EEOCC). Uniform guidelines on employee selection procedures. Draft, Aug. 23, 1973.

Zwarenstеyn, H. *Introduction to law*. East Lansing: Michigan State University Press, 1968.

BIBLIOGRAPHY

Ahlum, C., & Fralley, J. *Feminist studies*. Reprint from *Today's Education*, 1972, 61, 26.

Association of American Colleges. *Federal laws and regulations concerning sex discrimination in educational institutions*. Project on the Status of Education of Women. Washington: Author, 1972.

Campbell, D. P. Women deserve better. *Personnel and Guidance Journal*, 1973, 51, 545-549.

Carnegie Commission of Higher Education. *Opportunities for women in higher education*. New York: McGraw-Hill, 1973.

Civil Rights Act—Pre-employment testing requirements unrelated to job function held unlawful. *New York Law Forum*, 1972, 18, 264-271.

Cole, N. S. *On measuring the vocational interests of women.* (ACT Research Report No. 49) Iowa City: American College Testing Program, 1972.

Executive Order No. 11246, 1965, as amended by Executive Order No. 11375, 1967.

Huth, C. M. Measuring women's interests: How useful? *Personnel and Guidance Journal,* 1973, 51, 539-545.

Iglitzin, L. B. *A child's-eye view of sex roles.* Reprint from *Today's Education,* 1972, 61, 23-25.

Jacobs, C., & Eaton, C. *Sexism in the elementary school.* Reprint from *Today's Education,* 1972, 61, 20-22.

Levy, G. Do teachers sell girls short? Reprint from *Today's Education,* 1972, 61, 27-29.

Meagher, C. Guidance tests get A in sex bias. *Detroit Free Press,* April 5, 1972, sec. G, 1.

Nash, R. J., & Agne, R. M. Career education: Earning a living or living a life? *Phi Delta Kappan,* 1973, 54, 373-377.

Obligations of contractors and subcontractors. *Federal Register,* 1968, 33(104).

Reisner, A. Revised Order No. 4: A progress report. Unpublished report, New York, 1973.

Roth, D. C., & Stahl, P. C. Application of the EEOC guidelines to employment test validation: A uniform standard for both public and private employers. *George Washington Law Review,* 1973, 41, 505-537.

Saario, N., Jacklin, C. N., & Tittle, C. K. Sex role stereotyping in the public schools. *Harvard Educational Review,* 1973, 43, 386-416.

Sandler, B. The Day WEAL opened Pandora's box. *Chronicle of Higher Education,* 1973, 3(16).

Sandler, B., & Gleaves, F. Sex discrimination provisions concerning students and employees as contained in the Higher Education Act of 1972. (Project on the Status and Education of Women) Washington: Association of American Colleges, 1972.

Schlossberg, N. K., & Goodman, J. Imperative for change: Counselor use of the Strong Vocational Interest Blanks. *Impact,* 1972, 2, 25-31.

Schlossberg, N. K., & Pietrofesa, J. J. Perspectives on counseling bias: Implications for counselor education. *Counseling Psychologist,* 1973, 4, 44-54.

Steinmann, A. Female-role perception as a factor in counseling. *Journal of NAWDC,* 1970, 34, 26-33.

Tennyson, W. W., Hansen, L. S., Klaurens, M., & Antholz, M. B. *Teaching and counseling for career development.* St. Paul: Minnesota Department of Education, 1974, in press.

Tittle, C. K. Women and educational testing. *Phi Delta Kappan,* 1973, 55, 118-119.

U.S. Congress. H.R. 916, Women's Equality Act. 92d Cong., 1st sess., Jan. 22, 1971.

U.S. Congress, Senate. Sex discrimination provisions concerning students and employees as contained in the Education Amendments of 1972 (Higher Education Act) including the extension of the Equal Pay Act. *Congressional Record,* Senate S.S. 1357, July 20, 1972. Reprinted by Project on the Status and Education of Women, Association of American Colleges, Washington, D.C.

U.S. Department of Health, Education, and Welfare, Office of Education. *Education and women's rights: What the law now says.* Reprint from *American Education.* Washington: Government Printing Office, 1972.

Women's act gets support: Congressmen testify on sexism in schools, need for legislation. *APGA Guidepost,* 1973, 16, 4-5.

Zelermyer, W. *The process of legal reasoning.* Englewood Cliffs, N.J.: Prentice-hall, 1963.

COURT CASES CITED

Frontiero v. *Laird,* 341 F. Supp. 201 (U.S. Dist. Ala. 1972)

Griggs v. *Duke Power Co.,* 401 U.S. 424 (1971)

Grimm v. *Westinghouse Electric Corp.,* 300 F. Supp. 984, 988-989 (N.D. Cal. 1969)

Hobson v. *Hansen,* 269 F. Supp. 401 (D.D.C. 1967)

Myart v. *Motorola, Inc.,* 1190 Cong. Rec. 7213 (1964)

Reed v. *Reed,* 404 U.S. 71, 92 S. Ct. 251, 30 L. Ed. 2d 225 (1971)

RELATED COURT DECISIONS

Douglass v. *Hampton,* 338 F. Supp. 18 (D.D.C. 1972)

Penn v. *Stumpf,* 308 F. Supp. 1238 (N.D. Cal. 1970)

United States v. *Bethlehem Steel Corp.,* 312 F. Supp. 977 (W.D. N.Y. 1970)

United States v. *Georgia Power Co.,* Civil No. 71-3447, at 21 (5th Cir., Feb. 14, 1973)

United States v. *H. K. Porter Co.,* 296 F. Supp. 40 (N.D. Ala. 1968)

United States v. *Hayes Int'l Corp.,* 415 F. 2d 1038 (5th Cir. 1969)

United States v. *Jacksonville Terminal Co.,* 316 F. Supp. 567 (M.D. Fla. 1970)

List of Abbreviations

A, Artistic (Holland's classification)
ACT, The American College Testing Program
AERA, American Educational Research Association
AMEG, Association for Measurement and Evaluation in Guidance
APA, American Psychological Association
APGA, American Personnel and Guidance Association

C, Conventional (Holland's classification)
CE, career expectation
CEW, Continuing Education for Women
CSE, Center for the Study of Evaluation
CVIS, Computerized Vocational Information System (Willowbrook High School, Villa Park, Ill.)

DAT, Differential Aptitude Test Battery
DOT, Dictionary of Occupational Titles

E, Enterprising (Holland's classification)
ECES, Education and Career Exploration System (Carkhuff Associates)
EDGUYD, Milwaukee Computerized Educational Guidance System
EEOC, Equal Employment Opportunity Commission (U.S.)
EEOCC, Equal Employment Opportunity Coordinating Council (U.S.)
ETS, Educational Testing Service

FM, Feminity-Masculinity (scales)

GATB, General Aptitude Test Battery
GIS, Guidance Information System (Time Share Corp. and Houghton Mifflin)

HEW, Department of Health, Education, and Welfare

I, Investigative (Holland's classification)
ISVD, Information System for Vocational Decisions (Harvard University)

MF, Masculinity-Feminity (scales)
MMPI, Minnesota Multiphasic Personality Inventory
MVII, Minnesota Vocational Interest Inventory

NAWDC, National Association for Women Deans, Administrators, and Counselors
NIE, National Institute of Education
NVGA, National Vocational Guidance Association

OE, Office of Education
OIAS, Occupational Information Access System (Oregon)
OIS, Occupational Interest Survey (Kuder)
OVIS, Ohio Vocational Interest Survey

R, Realistic (Holland's classification)

S, Social (Holland's classification)
SCII, Strong-Campbell Interest Inventory
SDS, Self-Directed Search
SES, socioeconomic status
SIGI, System for Interactive Guidance and Information (ETS)
SVIB, Strong Vocational Interest Blank
SVIB-M, SVIB for Men
SVIB-W, SVIB for Women

VOCGUYD, Milwaukee Computerized Vocational Guidance System
VPI, Vocational Preference Inventory (SDS)

Index

Abramowitz, C. V., 147, 154
Abramowitz, S. I., 147, 154
Activity-similarity rationale, 6, 7, 9
Affirmative action (*see also* Guidelines; Research needed), 42, 103, 116, 117-118, 155, 204, 205, 206, 208-209
Age bias, 36, 57, 154, 157
Allen, B. V., 83
Almquist, E. M., 117, 151
American College Personnel Association, 208
American College Testing Program, Career Planning Program, 6, 11, 13-15, 36, 55, 57, 135, 152, 196
American Personnel and Guidance Association, 208, 209
American Psychological Association, 209
  guidelines to counter sex bias, 92, 106, 107, 208
  interpretation of Differential Aptitude Test, 196
  standards for tests, xxiv, 87, 90, 91, 96, 97-98, 112
Anastasi, A., 135
Angrist, S. S., 103, 104, 117, 151
Antonovsky, A., 127
Asian Americans, 103, 125, 132
Association for Counselor Education and Supervision, 208-209
Association for Measurement and Evaluation in Guidance, 21, 31, 32, 54, 58, 208
Astin, A. W., 37
Astin, H. S., 57
Audiovisual aids, 188, 191, 192-193, 196, 198
Auxiliary material for use with interest inventories. (*See* Interpretive material.)

Bachtold, L. J., 151
Back to School, Back to Work, 40
Balma, M. J., 134
Barabasz, A. S., 127
Bardwick, J. M., 146
Barrett, R. S., 136
Barron, F., 41
Basic interest scales. (*See* Homogeneous scales.)
Batchelder, A. B., 133
Beasley, J. A., 128
Bell, R. R., 127
Bellezza, F., 116
Bem, D. J., 40, 91, 93
Bem, S. L., 40, 91, 93
Bennett, G. K., 37
Berdie, R. F., 4, 77
Bergman, B. R., 95
Berman, H. H., 203
Berman, Y., 132
Bernard, J., 125, 131
Biased interest inventory, definition of, 24-25
Bingham, W. C., 147, 154
Bingham, W. V., 3
Bird, C., 47, 151
Birk, J. M., 95, 103
Black women. (*See* Minority groups.)
Blood, R. O., 150
Bock, E. W., 125, 126, 131
Bohn, M. J., 108, 115, 145, 156
Bordin, E. S., 4
Borgen, F. H., 170
Bradburn, N., 150
Brady, R. P., 111
Brooks, G. C., Jr., 36
Broverman, D. M., 114, 116, 144, 146-147, 154
Broverman, I. K., 114, 116, 144, 146-147, 154
Brown, D. B., 111
Bryce, R. A., 151
Burger, Chief Justice Warren E., 207
Buros, C. K., 47, 48, 50
Bustamente, D., 95

California Psychological Inventory, 69
Campbell, D. P. (*see also* Strong-Campbell Interest Inventory), 5, 9, 21, 22, 27, 28, 35, 36, 49-50, 51, 52, 54, 55, 57, 59, 61, 68, 69, 70, 72, 76, 78-79, 82, 83, 84, 93, 104, 105, 106, 108, 135, 170.
Career Development Inventory (Super), 195, 196
Career expectations, 111, 127-134, 144-146
Career exploration (*see also* Occupational options; Sexual stereotypes; Socialization process, effects of), xxvii, 2, 11-12, 12-16, 40, 91, 103-104, 108, 109, 112, 115-116, 117-118, 183, 184, 184-185, 185-186, 187, 189, 190, 191, 191-192, 192-193, 199
Career-marriage conflict. (*See* Home-career conflict.)
Career Maturity Inventory, 196
Career options. (*See* Occupational options.)
Career Planning (ACT), 6, 11, 13-15, 36, 55, 57, 135, 152, 196
Carter, D. E., 127
Carter, H. D., 4
Cassel, R. N., 173
Center for Interest Measurement Research, 50, 52, 57
Change of interests over time, 54-55, 82-84
Chess, E. L., 149
Children of working women, 149, 150
Chinese women, 132
Civil Rights Act (1964), 131, 156, 201, 202, 204, 205, 206, 206-207
Clark, K. E., 32, 72, 106
Clarkson, F. E., 114, 116, 144, 146-147, 154
Classification. (*See* Occupational classification.)
Cole, J. W., 40, 55
Cole, N. S., 6, 22, 40, 55, 57, 58, 61, 62, 77, 154
Comparative Guidance and Placement Test (ETS), 196
Comparative Guidance Placement Program (CEEB), 81
Computerized guidance systems, 23, 113, 170-174, 177-199
Computerized Vocational Information System (CVIS), 177, 182, 183, 186, 187, 188-189, 190, 191, 191-192, 192-193, 193, 194, 194-195, 199
Conroe, F. L., 58
Constantinople, A., 93, 105
Continuing Education for Women, 144, 155
Cook, B., 108
Cooper, J., 95, 103
Cosby, A., 127
Coser, R., 144, 149-150
Costs of developing and revising interest measurement instruments, 161-175, 195-196
Counselor, role of, 23, 39-40, 57-58, 61-62, 103, 108, 112-113, 113-118, 119, 138, 141-142, 143, 146-148, 149, 151, 152, 154, 155, 157
  in computer-based systems, 179, 180, 181, 182, 199
Counselors manuals. (*See* Interpretive material.)
Craven, E. C., 22, 155
Crissey, W. J. E., 55
Criterion scales. (*See* Occupational scales.)
Crites, J. O., 5, 22, 26, 55, 78, 103, 107, 196
Cross, K. P., 148

Dahlstrom, W. G., 69

Dailey, J. T., 40, 41
Daniel, W. J., 55
Darley, J. G., 4, 5, 54, 78, 134
Darlington, R. B., 36
Davis, R. V., 5
D'Costa, A. G., 6, 56, 116
Definition
  of biased interest inventory, 24-25
  of career interest inventory, xxiv, 134
  of interests, 1, 3-5
  of sex bias, xxiii, xxviii, 21, 32, 36, 67, 186
Deutsch, M., 135
Developmental costs. (*See* Costs of developing and revising interest measurement instruments.)
Dewey, C. R., 154
Diamond, E. E., 59, 93, 151, 152
Dictionary of Occupational Titles, 6, 40, 173, 190, 191
Differential Aptitude Test Battery, 173, 174, 196
Dolan, E. F., 144
Dolliver, P. H., 51, 52
Double negative bias, 124, 125, 136
Droege, R. C., 136
Dunnette, M. D., 77, 136

Earnings of women. (*See* Women in the labor force.)
Eastes, S. H., 170
Education Amendments of 1972 (Higher Education Act), xxiv, 112, 156, 163, 202, 207, 209
Education and Career Exploration System (ECES), 117, 182, 184-185, 189, 191, 192, 193, 194, 195
Education for the reentry woman, 148, 155
Educational Testing Service, 196
Eifler, D., 95
Empirical scales. ((*See* Occupational scales.)
Empiricism, 8
Employment practices. (*See* Intelligence and preemployment testing.)
Encyclopedia of Careers, 103
Endler, N. S., 77
England, G. W., 5
Entwisle, D. R., 144
Epstein, C. F., 125, 133, 144, 145, 152
Equal employment opportunity guidelines, xxiv, 204, 205, 206, 207
Equal Pay Act (1963), 156
Evaluation of interest inventories, 26-32
Evans, F. R., 136
Ewen, R. B., 136
Executive Order No. 11246, 156, 205
Expressed interests, 26-27, 112-113, 155
Eyde, L. D., 103, 147, 149, 154

Face validity, 58, 89-98
Family role of women. (*See* Home-career conflict; Reentry woman, the)
Farb, P., 92
Farmer, H. S., 108, 113, 115, 145, 156
Federal Contract Compliance (U.S.), Office of, 207
Ferguson, L. W., 83
Fichter, J. S., 129-131, 132, 133
Fifth amendment, U.S. Constitution, 204
Financing interest inventories, 161-175, 195-196
Findelman, J. J., 150
Firestone, S., 47
Fitzgerald, L. E., 208
Forrest, D. J. (*See* Myers, R. A.)
14th amendment, U.S. Constitution, 204, 205
Fox, D. J., 144-145
Frasher, R., 95
Frederiksen, N., 77
Fretz, B. R., 104, 108
Friedersdorf, 114, 114-115, 116
Frontiero v. *Laird*, 206
Fryer, D., 3

Gaier, E. L., 117
General Aptitude Test Battery, 173
General interest scales. (*See* Homogeneous scales.)
General Interest Survey. (*See* Kuder General Interest Survey.)
Ghiselli, E. E., 77
Gilbert, A. C., 77
Gillette, T. L., 150
Ginsberg, E., 126
Goldman, L., 56, 157
Gomes, B. (*See* Abramowitz, S. I.)
Goodman, J., 53, 93, 104, 108, 111, 208
Gottfredson, G.D., 33-34
Gough, H. G., 69
Gramba, J. D., 95
Grandy, T. G., 37
Gray-Shellberg, L., 144, 145, 146
Greenberger, E., 144
Greiner, W. R., 203
Griggs v. *Duke Power Co.*, 204-205, 207
Grimm v. *Westinghouse Electric Corp.*, 207
Grooms, R. R., 77
Groth, N. J., 146
Guidance Information System (GIS), 177, 181, 183, 185, 186, 189, 191, 192, 193
Guidelines (*see also* Standards for educational and psychological tests)
  of Government agencies, 21, 42, 202, 204, 206, 209
  proposed for improving interest measurement (*see also* Affirmative action; Research needed), xxiii-xxviii, 12-16, 38-42, 58-63, 69, 76-77, 79-80, 81-82, 85-87, 96-98, 107, 112-113, 117-118, 119, 137-138, 154-157, 174-175, 196-199, 209-210
Gump, J. P., 134
Gurin, M. G., 113
Gurin, P., 124, 128, 132-133

Hacker, S. L., 91, 105, 106, 110
Hagenah, T., 5-6, 54, 78, 134
Hall, G., 103
Handbooks. (*See* Interpretive material.)
Hansen, J. C., 36, 55, 57, 170
Hanson, G. R., xxviii, 6, 55, 77
Harmon, L. W., 21, 22, 35, 50, 51-52, 54, 56, 57, 61, 74, 103, 104, 109, 205
Harrington, T. F., 55
Harris, J. E., 180-181, 186, 194, 195, 199
Harvey, J., 145
Hawley, P., 114, 115-116, 144, 145, 146
Health, Education, and Welfare, Department of. (*See* Office of Education.)
Hedges, J. N., 103
Heist, P., 113
Helmreich, R., 31
Helms, S. T., 28-29, 37
Help-wanted ads, bias in, 91-92
Helson, R., 151
Hewer, V. H., 24
Hiestand, D. G., 126
Higher Education Act. (*See* Education Amendments of 1972.)
Hill, D. S., 54
Hill, R. B., 125, 126, 133
Hindelang, M. J., 127
Hobert, R., 136
Hobson v. *Hansen*, 205, 206
Hoepfner, R., 36
Hoffman, L. W., 145, 150
Hokada, E., 95

Holland, J. L. (*see also* Self-Directed Search), xxviii, 4, 5, 6, 9, 21, 25, 26, 27, 29, 33, 34, 35, 37, 40, 51, 55, 55-56, 57, 58, 59, 60, 61, 93, 94, 94-95, 103-104, 106, 107, 116-117, 170, 183, 189

Home-career conflict (*see also* Reentry woman, the), xxvii-xxviii, 61, 108, 113-114, 118, 124, 129-131, 133-134, 197-198
Homogeneous scales, xxvii, 9, 11, 32, 48-49, 55-56, 62, 63, 80-82, 86
  costs of constructing, 165, 169
  defined, 72
Hornaday, J. A., 77
House, E. W., 147, 154
Hunter, J. S., 148
Huth, C. M., 78, 93, 104, 107, 108

Ideal inventories, 22-24
Iglitzin, L. B., 111
Illinois Fair Employment Practice Commission, 206
Income of women. (*See* Women in the labor force.)
Information System for Vocational Decisions (ISVD), 182, 183
Instructions. (*See* Test instructions.)
Intelligence and preemployment testing
  judicial review of, 203, 204-206
  State laws on, 206
Interests
  change in, 54-55, 82-84
  correlation with abilities, 134-135
  definition of, 1, 3-5
  expressed, 26-27, 112-113, 155
  factorial structure of, 55-56
  measuring women's, 2, 8, 8-9, 47
  methods of measuring, 5-6
  mismatch of, 9-10, 135-136
  reasons for measuring (*see also* Uses of interest inventories), 1, 5, 12, 49, 67
  related to job satisfaction, 5-7, 10, 12, 13, 15
Interpretive Leaflet, 94, 104, 106, 110, 152
Interpretive material (*see also* Audiovisual aids; Responsibilities of test developers, publishers, and users; Test instructions), xxvi-xxviii, 23, 38, 38-39, 40, 57-58, 61-62, 63, 87, 104-107, 109-113, 118, 119, 138, 143-144, 150, 153, 156, 157, 163, 170, 188, 193, 198-199, 209-210
Iscoe, I., 145
Items
  bias in, xxv, 9, 35-36, 47, 49-51, 58-59, 62, 68-72, 85, 91, 93, 94, 97, 98, 153, 163
  sex differences in responses to, xxv, 49, 49-50, 58-59, 62, 69-72, 84, 85-86

Jackson, C. (*See* Abramowitz, S. I.)
Jackson, J. J., 130-131
James, William, 3
Job classification. (*See* Occupational classification.)
Job performance, test scores related to, 204, 207, 209
Job satisfaction related to interests, 5-7, 10, 12, 13, 15
Job titles. (*See* Occupational titles.)
Johansson, C. B., 36, 50, 51-52, 55, 57, 69, 74, 77, 82, 109, 170
Johnson, R. W., 77, 104, 109
Judicial decisions, 203, 204-206

Kaley, M. M., 147, 150
Kanowitz, L., 205
Karmon, F. J., 108, 113
Katz, D., 124, 128, 132, 132-133
Katzell, R. A., 136
Key, M. R., 95
Kichter, J. H., 144
Kimball, R. L., 36
King, L. A., 116
King, P., 55
King, P. T., 83
Kirchner, E. P., 25
Kirchner, W. K., 77
Kirkpatrick, J. J., 127, 136
Kitson, H. D., 3
Klein, S. P., 136
Kohn, M. L., 37
Komarovsky, M., 144
Kriger, S. F., 61
Krumboltz, J. D., 41
Kuder, G. F., 5, 22, 27, 51, 54, 55, 67-68, 73, 77-78, 78, 82, 91, 93, 106, 155
Kuder General Interest Survey, Form E, 80, 82, 104, 134
Kuder Occupational Interest Survey, Form DD, 6, 11, 24, 26, 38, 41, 48, 51-52, 54, 67-68, 68, 69, 73, 73-74, 77-78, 80, 90, 94, 96, 104, 106, 110, 116, 134, 152, 173-174, 205
Kuder Preference Record, 11, 48, 56, 134, 191-192
Kuhns, P. B., Jr., 6
Kuvlesky, W. P., 129-131

Labor-market information as source of sex bias, 137-138, 187, 190, 191, 197, 198
Laime, B. F., 78, 108
Language, bias in. (*See* sexually biased language.)
Lao, R. C., 128
Law. (*See* Legal issues.)
Lawshe, C. H., 134
Legal issues, 42, 163, 201-210
Leland, C., 144
Letchworth, G. E., 154
Lewis, A. H., 36
Lewis, E. C., 47, 144
Lindeman, R. H. (*See* Myers, R. A.)
Linn, R. L., 36
Little, C. A., 127-128
Liu, P., 150
Lloyd-Jones, E., 148
Lofquist, L. H., 5
Lubetkin, A. T., 148
Lubetkin, B. S., 148
Lykken, D. T., 136
Lynch, M. D., 55
Lyon, E. R., 144

Maddi, S. R., 37
Magoon, T. M., 103
Manuals. (*See* Interpretive material.)
Masculinity-Feminity scales, 9, 41, 69-70, 70-71, 93, 105
Maslow, A. P., 149
Matarazzo, J. D., 83
Mathews, E., 31
Mature woman, the. (*See* Reentry woman, the.)
McCall, R. J., 107, 108
McCarthy, M. K., 107, 108
McGowan, G., 150
McKiever, M. F., 149
McPartland, J. M., 29, 37
Mednick, M. T., 125, 134
Mehail, T., 173
Melhus, G. E., 186, 194, 195
Melville, S. D., 77
Mental Measurement Yearbook, 47, 48, 50
Mexican Americans. (*See* Spanish-heritage groups.)
Meyer, M. M., 111
Middle-aged women as achievers, 150-151
Miller, B. J., 144, 148, 151
Miller, K. S., 136
Miller, W. H., 151
Millett, K., 47
Mills, D. G., 104, 108
Milwaukee Computerized Educational Guidance System (EDGUYD), 173-174
Milwaukee Computerized Vocational Guidance System (VOCGUYD), 173-174
Minnesota Multiphasic Personality Inventory, 69
Minnesota Vocational Interest Inventory, 48, 55, 106-107, 152, 153-154, 205
Minority groups, xxvi, xxvii, 123-138, 144-145, 149, 151
Mismatch of interests, 10, 124, 135-136
Moderator variables, 77, 87, 124, 135-137
Modernization factor, 83, 86
Moynihan, D., 125, 131
Munday, Leo A., 1
Munley, P. H., 104, 108
Myart v. Motorola, Inc., 206-207
Myers, C. A., 154
Myers, R. A., 186, 195
Myint, T., 57

Nachmann, B., 113
Nafziger, D. H., 29, 37
National Association for Women Deans, Administrators, and Counselors, 208
National Association of Student Personnel Administrators, 208
National Institute of Education, xxiii, 21, 26, 67, 125, 137, 187
National Manpower Council, 150, 154
National Vocational Guidance Association, 90, 91, 96-97, 98, 209
  commission on computers in guidance, 180-181, 183, 199

Nelson, G. A., 113
Nelson, R. C., 111
Neulinger, J., 147, 154
Noeth, R. J., 9, 25
Nonverbal Aptitude Test Battery, 173
Norell, G., 55
Norms (*see also* Moderator variables; Scales; Validity of interest measures), xxv, 11, 15, 32-34, 38, 49, 56-57, 59-60, 62, 81-82, 86, 97, 191-192, 205, 209
  for minority groups, 135-136, 138
Northcross, W., 204
Norton, E. H., 145
Novick, Melvin R., 1
Nunnally, J. C., 32
Nye, J. F., 150

Obordo, A. S., 129-131
Occupational classification, 6, 25, 40, 92, 152-153, 183, 189, 191-192, 192-193, 205, 205-206
Occupational exploration. (*See* Career exploration.)
Occupational Information Access System (OIAS), 177, 184, 186, 189, 190, 191, 192, 193
Occupational Interest Survey. (*See* Kuder Occupational Interest Survey.)
Occupational options (*see also* Career exploration; Sexual stereotypes; Socialization process, effects of; Women in the labor force), xxvi, xxvii, 22, 27, 28-31, 39, 95, 96-97, 143, 180, 197, 198
Occupational Outlook Handbook, 103, 173
Occupational preferences, change of, 82-84
Occupational scales, 9, 11, 32, 48, 49, 51-55, 59, 62, 63, 72-79, 85-86, 205, 206
  costs of constructing, 165, 170
  defined, 72
  developed on opposite sex, 77-79
Occupational statistics as source of sex bias, 137-138, 187, 190, 191, 197, 198
Occupational titles (*see also* Sexually biased language), xxv, 35, 47, 50-51, 68, 69, 92, 93, 94, 152-153, 157, 187, 189, 189-190, 191, 197, 198
Occupations Finder (SDS), 60, 94
Odgers, J. G., 6
Office of Education, 28, 31, 32, 180
O'Hara, R. P., 31
Ohio Vocational Interest Survey, 6, 56, 116, 152, 173, 174, 192, 196
Olive, R. C., 111
Opportunity dominance hypothesis, 10-11, 15
Orden, S., 150
Oregon Career Information System. (*See* Occupational Information Access System.)
Osborn, R., 148
O'Shea, A. J., 55

Panos, R. J., 37
Parsons, F., 5
Parsons, T., 47
Pearlman, J., 40
People-similarity rationale, 5-6, 6-7, 8-9
Personnel and Guidance Journal, 180
Peterson, R. A., 170
Phillips, B. N., 127
Picou, J. S., 128
Pietrofesa, J., 103, 114, 116, 117-118, 147, 154
Pirtle, C., 94
Pottinger, S., 207
Powers, P., 55
Predictive validity. (*See* Validity of interest measures.)
Prediger, D. J., xxviii, 1, 6, 9, 12, 12-13, 25, 103
Preference Record. (*See* Kuder Preference Record.)
Price, G. E., 186, 194, 195
Pringle, M. B., 103
Professional associations, role of, 42, 204, 208-209
Professions, women in the, 126, 131-132, 149-150, 151
Profiles. (*See* Interpretive material.)
Public Health Service Act, 156
Publishers. (*See* Responsibilities of test developers, publishers, and users.)
Puerto Ricans. (*See* Spanish-heritage groups.)

Race as a factor in sex bias, 123-138
Randolph, K. S., 148
Recommendations. (*See* Guidelines.)
Redmond, R. E., 15, 28, 31, 41
Reed v. *Reed*, 205-206
Reentry woman, the (*see also* Home-career conflict), xxvii, 57, 141-157, 197, 197-198
Research needed, 2, 31-32, 39, 41-42, 56-57, 62, 96, 98, 137, 142, 155, 197-198
Resnikoff, A., 40

Responsibilities of test developers, publishers, and users (*see also* Change of interests over time; Interpretive material; Revision of interest inventories), xxv-xxvi, 39, 59, 63, 77, 87, 95, 96-98, 138, 147-148, 148, 155, 156, 157, 163, 164, 169, 170, 197, 210
Revision of interest inventories (*see also* Change of interests over time; Responsibilities of test developers, publishers, and users)
  in computerized systems, 179, 195-196
  costs of, 161-162, 163, 164-169, 175
  need for, xxvi, 32, 35-36, 38, 86
Richards, J. M., Jr., 6, 55, 58
Rock, D. A., 136
Roe, A., 55, 61, 192
Rokoff, G., 144, 149-150
Rose, R., 136
Rosenkrantz, P. S., 114, 116, 144, 146-147, 154
Ross, C., 95
Rosser, D. S., 180, 183
Rossi, A. S., 114
Roth, J. D., 6, 9, 25
Ruslink, D. H., 154
Ryan, D. W., 117

Saslow, G., 83
Saunders, D. R., 136
Scales (*see also* Moderator variables; Norms; Validity of interest measures), xxv, xxvii, 9, 11, 32, 48-49, 51-56, 59, 62-63, 69, 70-71, 72-82, 85-86, 93, 105, 106, 165-169, 170, 205, 206, 209
Scanzoni, J. H., 133
Schissel, R. F., 61
Schlossberg, N. K., 53, 93, 103, 104, 108, 111, 114, 116, 117, 147, 154, 208
Schneider, J. W., 91, 105, 106, 110
Schnuelle, L., 15, 28, 31, 41, 95
Schooler, C., 37
Schroeder, W. W., 41
Schwartz, J., 149
Schwartz, R. D., 93
Scientific issues. (*See* Technical aspects.)
Scores related to job performance, 204, 207, 209
Scott, Foresman & Co., guidelines, xxviii, 92, 106, 107
Seashore, H. G., 37, 77
Sechrest, L., 93
Sedlacek, . E., 36
Sesar, B. N., 143, 156
Segal, S. J., 113
Seifer, N., 146

Self-Directed Search (Holland), 6, 9, 11, 13-15, 24, 26, 28-30, 31, 33, 34, 36-37, 38, 41, 56, 90, 94-96, 106, 107, 113, 152, 153, 196

Separate inventory forms (*see also* Strong Vocational Interest Blank), xxv, 34-35, 50, 85, 209

Separate norm groups and scales. (*See* Norms; Scales.)
Sex bias, definition of, xxiii, xxviii, 21, 32, 36, 67, 186
Sex differences
  problems of. (*See* Career exploration; Occupational options; Sexual stereotypes; Socialization process, effects of.)

in responses to items, xxv, 49, 49-50, 58, 62, 69-72, 82, 84, 85-86
Sexual stereotypes *(see also* Career exploration; Occupational options; Occupational titles; Socialization process, effects of), xxvii, xxviii, 74-76, 91, 92, 95-96, 103, 105, 109-113, 115-116, 118, 149, 151, 151-152, 188, 189, 192, 198-199, 205
Sexually biased language *(See also* Occupational titles), xxv, xxvii, 50-51, 69, 89, 91, 92, 94, 96, 105, 105-106, 112, 152, 157, 187, 188, 189, 190, 190-191, 191, 192, 193, 197, 198, 209
Siegel, C. L., 25
Single-sex inventory. *(See* Minnesota Vocational Interest Inventory.)
Smith, M. L., 114, 116
Sobeloff, Judge Simon E., 205
Social action. *(See* Affirmative action.)
Socialization process, effects of *(see also* Career exploration; Occupational options; Sexual stereotypes), xxvi, 7-11, 15, 24-25, 36-38, 86-87, 94, 95, 98, 104, 106, 116, 116-118, 119, 143, 144-146, 150, 155
Sorkin, A. L., 126, 131
Spanish-heritage groups, 123, 125, 127, 128, 132, 135
Sparks, J., 107-108
Spence, J. T., 31
Spokeswoman, 146
SRA Occupational Briefs, 103
Standards for educational and psychological tests, xxiv, 87, 90, 91, 96-97, 112
Stanfiel, J. D., 52, 54, 108
State laws regarding tests, 206
Statistical Reporter, 152-153
Statistics. *(See* Occupational statistics as source of sex bias.)
Status quo, reliance on. *(See* Socialization process, effects of.)
Steinmann, A., 144-145, 148
Stevens, N. D., 151
Stewart, N. R., 114, 116, 147, 154
Stone, S., 144, 145, 146
Strickland, G. P., 36
Strong, E. K., Jr., 3-4, 5, 7, 36, 47, 51, 54, 59, 68, 69, 72, 91, 135, 161, 163
Strong-Campbell Interest Inventory, 11, 24, 32, 36, 38, 50, 52, 55, 58, 90, 93, 96, 104, 109, 111, 137, 152, 153, 170, 175, 205
Strong Vocational Interest Blank, 6, 9, 26-27, 36-37, 38, 41, 47, 48, 50, 51, 52, 54, 55, 56, 57, 61, 68-69, 69, 70-72, 72-76, 77, 78-79, 80, 83, 90, 93, 104-106, 107-109, 116, 118-119, 134-135, 137, 145, 161-162, 163, 164, 165, 170, 173, 174, 175, 205
Student manuals. *(See* Interpretive material.)
Super, D. E., 4, 22, 55, 78, 107, 186, 195
Supreme Court, U.S., review of testing and employment practices, 204, 205-206
System for Interactive Guidance and Information (SIGI), 177, 182, 185-186, 189, 191, 192, 193

Tanney, M. F., 95, 103
Technical aspects *(see also* Computerized guidance systems), xxv-xxvi, 32-37, 45-63, 85-87, 134-137
"Technology in Guidance," 180
Test developers, publishers, and users. *(See* Responsibilities of test developers, publishers, and users.)
Test instructions *(see also* Interpretive material), 107-109, 118, 153, 155-156, 157, 163, 188
Test manuals. *(See* Interpretive material.)
Test scores related to job performance, 204, 207, 209
Test standards. *(See* Standards for educational and psychological tests.)
Tests. *(See* Intelligence and preemployment testing; Interest inventories.)
Thomas, A. H., 114, 115, 116, 147, 154
Thompson, A. S., 194, 195
Thorpe, C. B., 128
Thrush, R. S., 83
Thurstone, L. L., 55, 134
Tiedeman, D. V., 31
Tilton, J. W., 60
Time-biasing factor, 83
Title IX. *(See* Educational Amendments of 1972.)
Tittle, C. K., 91, 93, 94, 104, 110, 111, 113
Truth, Sojourner, 151
Turner, B. F., 124, 132-134

U.S. Congress, 207, 208
U.S. Department of Commerce, 92, 125, 148, 149, 154
U.S. Department of Labor, 61, 103, 145, 148, 149, 150, 154, 184, 197, 205, 207
U.S. Office of Education. *(See* Office of Education.)
Unused-item-pool hypothesis, 35
Updating inventories. *(See* Revision of inventories.)
Users manuals. *(See* Interpretive material.)
Uses of interest inventories *(see also* Interests, reasons for measuring), 12-16, 21-25, 67, 116-118, 119, 135, 188, 191-192, 205, 208, 210

Validity of interest measures *(see also* Face validity; Moderator variables; Norms; Scales; Test scores related to job performance), xxvi, 6-7, 15, 26, 56-57, 59, 60-61, 97, 124, 135-136
Variables, moderator. *(See* Moderator variables.)
Verheyden-Hilliard, M. E., 144, 146
Villareal, S., 144, 145, 146
Vocational Interest Profile (ACT), 36, 55, 57
Vocational interests, change in, 82-84
Vocational Planning Inventory (SRA), 192
Vocational Preference Inventory, 26, 28, 51, 55, 56
Vogel, S. R., 114, 116, 144, 146-147, 154
Vondracek, S. I., 25

Walker, A., 95
Want ads, bias in, 91-92
Webb, E. J., 93
Weinstein, J., 180
Weisstein, N., 144, 154
Weitzman, L. J., 95
Welsh, G. S., 69
Werts, C. E., 37
Wesman, A. G., 37
Westervelt, E. M., 146, 148
Weston, P. J., 125, 134
Whitney, D. R., 6, 37, 55, 58
Wiens, A., 83
Williams, G. D., 28
Williams, M., 145
Williams, R. L., 136, 137
Winefordner, D. W., 6
Withycombe-Brocato, C. J., 148
Wolfe, D. M., 150
Women in high-level positions, 150-151
Women in the labor force, 61, 95-96, 103, 123, 125-126, 131-132, 134, 143-152
Women on Words and Images, 47
Womer, F. B., 134
Working women. *(See* Women in the labor force.)

Zener, T. B., 15, 28, 31, 41, 95
Zwarensteyn, H., 204
Zytowski, D. G., 48, 52, 55, 56, 78, 108